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[Authors alone are responsible for the contents of their respective Papers.]

SECRETARY'S NOTES.

1. The Council regret to record the death of Admiral Sir E. G. Fanshawe, G.C.B., a Vice-President, who had for 69 years been a member of the Institution.

2. Rear-Admiral H.S.H. Prince Louis of Battenberg, G.C.B., G.C.V.O., K.C.M.G., A.D.C., has been appointed a Vice-President, vice Admiral Sir E. G. Fanshawe, deceased.

3. Colonel J. A. L. Haldane, C.B., D.S.O., has been appointed by the Army Council to succeed Colonel F. J. Davies as War Office representative on the Council.

4. The following Officers joined the Institution during the month of October :—

Lieutenant R. H. Carrington, R.F.A.

Second Lieutenant S. D. Wilmot, R.G.A.

Lieutenant A. G. K. Davies-Cooke, 10th Royal Hussars.

Captain A. F. Becke, late R.A.

Lieutenant C. T. S. Paul, R.F.A.

Second Lieutenant H. G. Riley, North Staffordshire Regiment.

Lieutenant G. M. I. Herford, R.M.L.I.

W. E. S. Thompson, Esq. (Admiralty).

Captain E. R. Jones, Cheshire Regiment.

Captain J. B. G. Tulloch, Yorkshire Light Infantry.

Lieutenant A. McB. Woodside, R.G.A.

Lieutenant C. V. Stockwell, R.F.A.

Lieutenant D. leP. Trench, R.F.A.

Midshipman R. C. Anderson, R.N.V.R.

Lieutenant C. P. Nicolas, Royal Warwickshire Regiment.

Captain H. T. Cantan, Duke of Cornwall's Light Infantry.

Lieutenant G. A. W. Spencer, Rifle Brigade.

Lieutenant P. A. Meldon, R.F.A.

Captain C. S. Holland, R.F.A.

Second Lieutenant W. C. Robison, King's Colonials, I.Y.

Major N. G. Woodyatt, 3rd Gurkha Rifles.

Major A. Le G. Jacob, D.S.O., Indian Army.
 Captain W. M. K. Marshall, Gordon Highlanders.
 Lieutenant Hon. F. R. D. Prittie, Rifle Brigade.
 Major S. H. Pedley, Royal West Kent Regiment.
 Major A. J. Pilcher, R.E.
 Sub-Lieutenant A. G. Harris, R.N.
 Deputy-Inspector-General J. O'B. Williams, R.N.
 Lieutenant R. Steuart-Menzies, Scots Guards.
 Lieutenant F. V. Yeats Brown, K.R.R.C.
 Captain W. E. M. Tyndall, D.S.O., West Riding Regiment.
 Captain F. W. O. Maycock, King's African Rifles.
 Captain H. G. Watkin, 4th Hussars.
 Lieutenant B. Walcot, R.E.
 Captain J. E. H. Cockburn, R.G.A.
 Lieutenant G. D'A. Elliott-Cooper, Royal Fusiliers.
 Captain C. H. Frith, Oxfordshire Light Infantry.

5. IMPORTANT.—The First Commissioner of H.M. Works having decided to thoroughly overhaul the roof of the Banqueting House at the same time as the restoration of the Rubens ceiling, it has been found necessary to close the Museum entirely. It will therefore be closed from *15th November*. Every effort will be made to push the work on as rapidly as possible, and it is hoped that it will be open again in the early spring. All possible arrangements will be made for the safe custody of the exhibits, including the loan relics.

6. Essays bearing the following mottoes have been received for the Naval Prize Essay, 1906:—

"Victory is to the Strong."
 "Paraid and Garaven."
 "Fronti nulla fides."
 "Running Brooks."
 "Honor for the Pilot, Truth for the Rudder."
 "For King, the Law, and the People."
 "Strike Hard, and Strike Again."
 "Qui trop Embrasse mal etreint."
 "The Philistines are upon you, Samson."
 "Swifter than Eagles." (Cable received.)
 "Jeldi Jao."

7. The Librarian will be obliged if members of the Lending Library when returning books would always enclose their names on a card with the parcel, otherwise it is impossible to know from whom the books have been returned, as there are frequently several copies of the same work out at the same time.

8. Officers are reminded that all changes of rank and address must be communicated to the Secretary not later than the 10th of the month.

REFLECTIONS, HISTORIC AND OTHER,
SUGGESTED BY THE
BATTLE OF THE JAPAN SEA.

By Captain A. T. MAHAN, U.S. Navy.

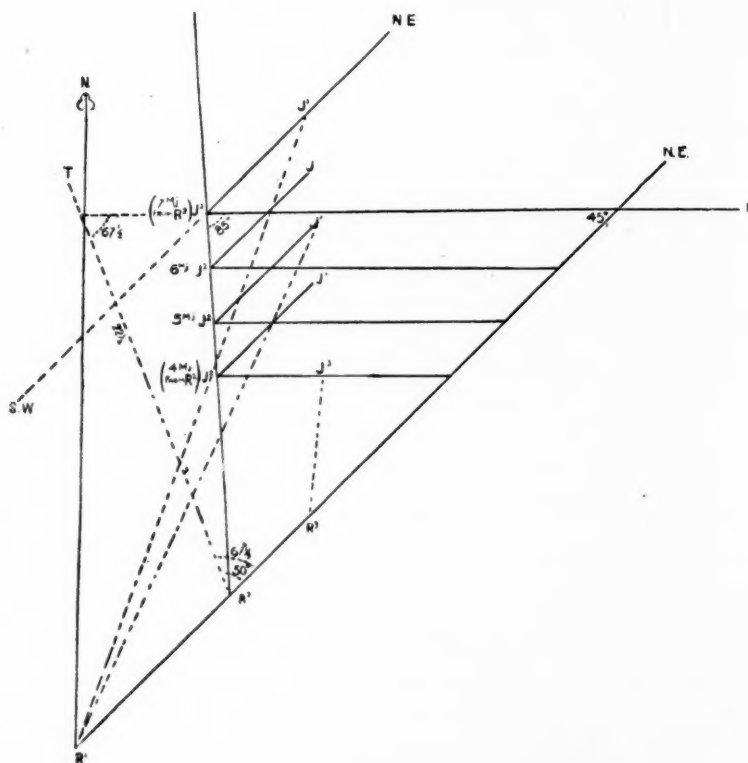
Reproduced by permission from the Proceedings of the United States
Naval Institute.

THE principal and determining features of the Battle of the Japan Sea have been made known to us by the official reports; but many details are wanting, and, as was justly remarked in a very able article in *Blackwood's Magazine* for last February, probably can never be supplied, the drama having passed too rapidly, and the actors having been too busily occupied, to take precise notes. The writer of the paper therefore devoted part of his space to an investigation of the problem, and to an attempt to reconstitute the earlier features of the engagement, as well as its subsequent phases. It is to this discussion that I owed the study embodied in the following plan, in which I have also availed myself of some of his data, more particularly with reference to the train of the guns of either party; but the particular line of enquiry which I have followed differs, I think, somewhat from his. It is in any event merely tentative; and its principal use, except as an attempt, to solve a question of reasonable professional interest, lies in familiarising the mind with some of the conditions of the encounter, and so making more easy the reflections which appear to follow naturally, from considering the relative position of the combatants.

Admiral Togo, in his report, says that at 1.45 p.m. the Russians were first seen from his flag-ship, "a few miles to the south." As they were known to be heading northeast, he then steered southwest, to deceive them into the impression that he meant to pass by in an opposite parallel direction. He does not report whether his fleet during this demonstration was in line abreast or line ahead. The latter might readily be presumed, but I have seen no positive statement to that effect; whereas one Russian account explicitly says: "A little after 12,¹ seventeen powerful ships of the enemy were sighted, in line abreast, holding a course from northeast to southwest, and at an angle of approximately 45° to us." From such a disposition the

¹ The other times of this account are a half-hour fast.

line of battle, east, could be instantaneously formed. However, whatever the first formation, the southwest course continued till 2.05 p.m., when it was suddenly changed to east; three minutes after which, or at 2.08, the Russians opened fire, having, however, before that "slightly changed their course to the right,"—kept off. Up to that time they had been steering northeast, at a speed of about twelve knots.



Nothing definite, either in distance or bearing, is herein given about the positions, or speeds, of the Japanese. Assuming R^1 as the Russian position when first seen, we have from it the course, northeast, and the time, twenty minutes, one-third of an hour, to the moment when Togo headed east. As the Russian speed was about twelve knots, laying off four miles on a northeast course gives us R^2 , as the position of the head of the Russian column at the same moment. R^1 and R^2 are assured positions. Now, as the full force of the Russian broadside could only train 40 to 45 degrees forward of the beam, it seems reasonable to conclude that the Japanese admiral would execute his change of course either by the time the guns could

bear upon him, or at a distance when their so bearing would not be very material; while he would keep coincidentally in view the train of his own guns, which was slightly less than that of his opponents.

R^2 being the position of the leaders of the Russian left column at 2.05, I draw the line $R^2 J^2$ making with the northeast course an angle of 50 degrees, giving a compass bearing of N. 50° W., or 40° forward of the Russian beam. This is conjecturally the bearing of the head of the Japanese column when round to an east course, and as part of the Russian battery would then bear but scantily, the movement of keeping off, which ensued at once, and before opening fire, would be natural. Upon the line $R^2 J^2$ lay off by scale the distances four, five, six, and seven miles, which in yards would be respectively eight, ten, twelve, and fourteen thousand. Like the bearing, these distances are conjectural, but the truth very probably lies somewhere between the two extremes. Accepting them successively, and laying off from each a compass northeast, we have for each the southwest line down which the Japanese ran while the Russians were moving northeast four miles, from R^1 to R^2 . Admiral Togo has not favoured us with his rate of steaming on this course; but as there was no cause for haste, rather the reverse, I presume he did not go over two or three miles to the Russian four. Taking such distance as rather less than three miles, we get the several positions, J^1 , corresponding to R^1 , according to the several estimates of the distance between the opponents, at the moment when the Japanese went about and the Russians opened fire. By protractor and scale it appears that for a distance ($R^2 J^2$) of seven miles, the Russians when first seen by Togo bore from him S. 20° W., distant something over 12 miles; for a distance of five miles, S. 25° W., distant 10-2-3 miles. The latter is not improbable.

It is expedient to notice here one or two surface facts. By taking the general position he did, to which the several points J^1 are conjectural approximations, the Japanese admiral preserved to himself interior lines of movement—shorter distances to cover—whatever course the Russians might take, unless they retreated. That is, he secured for himself the certainty of bringing the enemy to battle, quite irrespective of any superiority of speed on his part. The course steered by each from R^2 and J^2 , by their intersection complete a triangle, of which much the longer side belonged to the Russians. Not unless Togo, steering S.W., had continued to the line $R^2 T$, bringing the enemy at R^2 to bear S.S.E., would the distance to be run have become equal; and the consequences of such continuance entailing not only more distance to run, but more extreme strain for his guns and less for those of the Russians, were too obvious to be tempting. Whatever use he made of this primary advantage, however, the admiral had secured it by the position taken, on full information. All things considered, the most commanding bearing on which to have the enemy was due south, and it is probable that he did not greatly depart from that to either hand before going about. Again, should both fleets continue on their respective courses, east and northeast, maintaining equal speeds—as to J^1 and R^1 —not only would they draw together, but the Japanese, having the interior line, would draw ahead at their discretion, throwing the Russian broadsides more and more out of action. Further, in order to overcome this disadvantage, the Russians would need a speed of fourteen knots to a Japanese ten, or seventeen to a Japanese twelve; a

difference of speed beyond that contemplated as possible, in clean bottomed ships, by either the advocates or opponents of very high speed in battle-ships. This difference in favour of the Japanese resulted from choice of position relative to the enemy's probable objects, and not from the superiority of speed they undoubtedly possessed.

Prior to the late war, the importance of speed to battle-ships was necessarily discussed and determined upon *a priori* reasoning. It will be well to see what further light may seem to be thrown upon the question by the events of the war itself. Concerning this there is necessary the warning that such illustration is inevitably partial; for the instances are limited, and generalisation from them must not be too dogmatic. As far as it goes, however, it will possess the advantage of the concrete over the abstract; and will itself give occasion to some theoretical reasoning based upon simple geometrical considerations, which to my own mind possesses weight.

Essentially, the Russian fleet in the late war was placed upon, and willingly accepted, the defensive. The battle of the Japan Sea is itself but an instance of this, for the Russian aim there was not to destroy the enemy, but to escape to Vladivostok. It was the cardinal, and, in view of the aggregate size of their navy, most discreditable feature of the campaign as a whole on their part, that no decided attempt was ever made to destroy the Japanese fleet by sheer hard fighting. This applies more particularly to the Port Arthur division in its general management, and especially in the two sorties of 23rd June and 10th August, 1904, in neither of which can be traced the slightest influence of the Nelsonic maxim, "By the time the enemy had beaten us soundly, they would do no more harm this year." Having thus neglected all opportunity of clearing the way for the Baltic division, and the Japanese having by the fall of Port Arthur obtained opportunity thoroughly to refit their fleet, Rodjestvensky was pretty well compelled to adopt first a defensive strategic object; that, namely, of reaching Vladivostok with as little fighting as possible, in order to put his own vessels as near as might be on a material equality of condition with their opponents, and also to associate to himself such other Russian ships as the place contained. His fleet was the last naval hope of Russia, as Togo's had all along been the sole naval reliance upon which Japan could rest; he was justified accordingly in wishing to put himself on the best possible footing before daring the issue that must in the end be dared, if the tide of war was to be reversed in Russia's favour. What bearing would the highest speed of his battle-ships have had upon his movements? That of unarmoured cruisers is not here in account, one way or the other.

We know what actually happened, though that as yet imperfectly. Upon this chiefly we must reason, but are at liberty also to consider by the way alternative courses of action, open to the Russian admiral after his arrival in Far Eastern waters. By the Naval Annual of 1905, the speeds of the chief battle-ships, whose names became familiar to us through the battle of Tsushima, were from eighteen to eighteen-and-a-half knots. Without taking too literally this result over the measured mile, we may assume that the original speed of the chief battle force on either side was substantially equal, with a slight advantage in favour of Japan. It is true that this assumption somewhat traverses the exultation deriving from each quarter-knot extra

speed on a trial trip; but it is not unsound in practice. Actually, the Russian fleet had a very long voyage before reaching the scene of operations, where its enemy already was; but, if the two had had voyages of equal length to make, the time of arrival—a strategic consideration—would have depended less upon the small difference of speed above given, than upon accompanying circumstances of weather, coal endurance, the quality of coals available, facilities and rapidity for coaling on the way, not to mention unforeseeable accidents. However, assuming that, whatever the relative experiences in these ways, the faster fleet arrives first, of what advantage would it be, if the gain of time has been due to speed obtained at the sacrifice of fighting power? The enemy on coming up keeps the field; or, if encountered and equally skilful, conquers in battle by superior force.

In the event, the Russian fleet arrived upon a ground long before held by its enemy; and the speed of its line of battle was gravely diminished by the fouling of the bottom inevitable in such an experience as it had undergone. Further, and of more general importance to the consideration before us, because of universal application, the speed of the faster ships had to be reduced to that of the heterogeneous slower vessels which had been added to raise the fighting power of the whole body. It is not likely that another modern fleet will soon again present such diversity of types as the last agony of Russia compelled her to assemble; but the fast battle-ship built this year will always find her speed conditioned and lowered in the same way by that built three years ago, so long as the standards of size and consequent speed depend upon the ship your neighbour is laying down. We are at the beginning of a series to which there is no logical end, except the power of naval architects to increase size.

In 1898, just after the war with Spain, I made this remark to the then Secretary of the Navy; saying that, on the path we were treading. I saw no reason why we should not reach 20,000 tons, nor why stop there. He replied, that he saw no reason to apprehend such an issue. In a very recent number of the *Proceedings of the Naval Institute*, an officer with whose professional intelligence and thoughtfulness I have ample acquaintance, writes that he had asked a naval architect what sized ship would be requisite to embody all the high qualities now demanded. The reply was 50,000 tons. To this the officer would not accede, but he believed 20,000 would be needed. Why he thought the progression must stop there, I did not understand. The point to be tenaciously remembered is, that the 20-knot-ship must, as a rule, come down to the speed of the 18-knot; for battle-ships are built to work together. The only case in which inequality of speed may be utilised is in the close pursuit of a flying enemy—what our forbears called “a general chase.” There the faster ships may overtake the enemy's slower, and compel the whole body to fight or abandon them; but in such case, if speed have been gained at the sacrifice of gun power, the advantage is contestable, unless the main force of the pursuer is very close behind.

An instance partly in point was afforded in Kamimura's pursuit of the Port Arthur division of armoured cruisers, in August, 1904. The “Rurik” having been disabled in the engagement, Kamimura pressed on after her two consorts, leaving the reduction of the “Rurik” to two of his unarmoured cruisers. The “Rurik's” speed being reduced, and her steering gear damaged, the Japanese vessels, though inferior in force and only of equal original speed, were enabled to

maintain their positions under her stern, where her power of injuring them was reduced to a minimum; and they kept her engaged until their armoured vessels returned, when the Russians opened her valves and she sank. This presented the essentials of a general chase in the holding of an enemy's vessel till the main force comes up,—in this case, back; and the incident of inability to steer is precisely one of the determining features in a general chase, for the rear vessel in such case cannot deflect. She must keep on after her consorts; for, if she turns to fight, she facilitates the approach of the enemy's slower main body. To this chiefly was due the preponderance of injury received from a weaker opponent by the American frigate "President," when chased by a British squadron in 1815. She could not turn upon her immediate assailant, because of the latter's consorts following at a distance in her wake. So the British frigate "Penelope" hung effectively upon the quarters of the French 80-gun ship "Guillaume Tell," seeking to escape from Malta in 1800, and contributed powerfully to her capture by the squadron, the approach of which prevented the ship of the line turning her broadside on her swift but petty foe.

At the meeting off Tsushima, in May, 1905, the Japanese battle fleet proper had over the Russian an advantage of two or three knots speed at the time when Rodjestvensky came abreast the north point of Formosa; the moment when the strategic campaign may be said to have opened. Of what determining advantage was this excess of speed to Admiral Togo? The latter had to consider that, granting the Russians had coal enough, it was open to them either to proceed by the straits of Korea, as they did, or to the east of Japan, coming out by the Tsugaru straits, abreast Vladivostok. By the latter route they must cover 2,100 miles, against 1,200 by the former. We are told that Togo remained convinced throughout that the shorter road would be taken; but, by the position in which he placed his fleet, at Masampho, he insured intercepting the enemy irrespective of relative speeds, though certainly not irrespective of the damaging accidents to which all military plans are liable. Masampho is but fifty miles from the north end of Tsushima, which may be regarded as the geographical centre, around which revolved all operations, actual or possible. For the larger view of campaign issues, the two positions are identical. From Tsushima to Vladivostok is 500 miles; from the west end of the Tsugaru strait to Vladivostok is 400. Supposing Rodjestvensky to take the Tsugaru route, and the two fleets to have equal speeds of twelve knots—that maintained by the Russians—Togo, in order to intercept the enemy off Vladivostok, would need to know that they were not coming by way of Tsushima only nine hours before they cleared the straits; for he would have only 100 miles more than they to steam. If, instead of off Vladivostok, he should prefer to meet the enemy as they came out of the Tsugaru straits, he would need the same knowledge of their intentions little over two days,—which at twelve knots is 576 miles,—before they cleared the straits; for the western exit is but 600 miles from Tsushima. As the way round the east side of Japan is so much the longer, there would be ample time to receive the needed information, and to decide where to await the enemy. In short, Togo was quite able to grapple with the strategy of the conditions upon terms of equal speed; and it may be added even with speed inferior by two or three knots. By the choice of central position, insuring interior lines, and by adequate measures for receiving intelligence, he made himself master of the

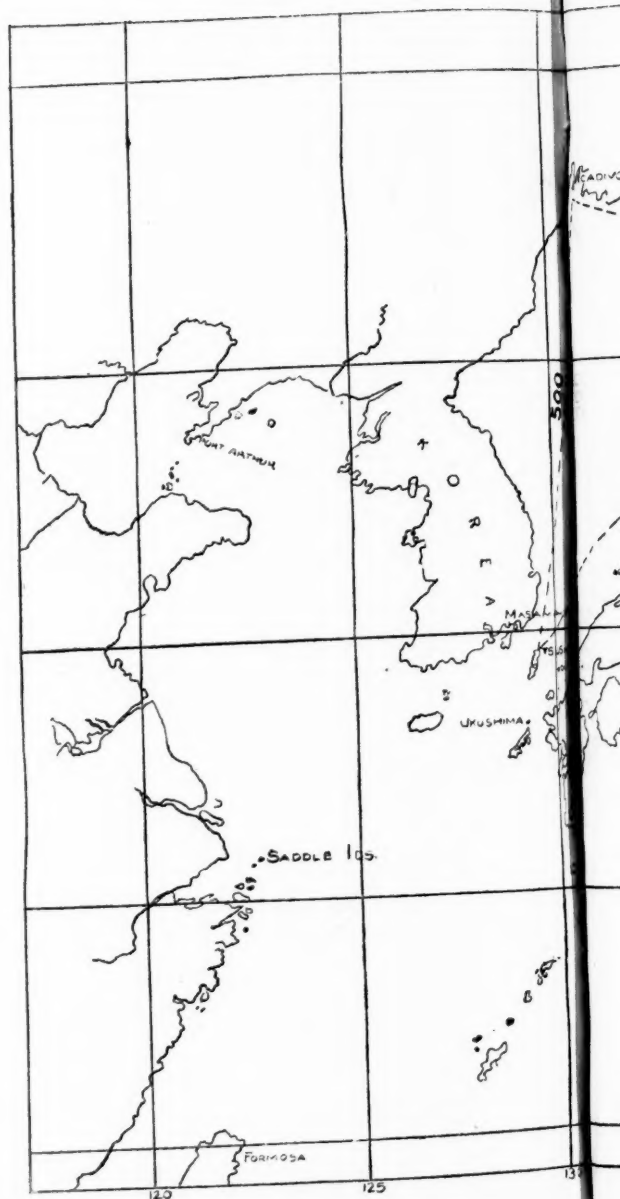
strategical situation independent of probable speeds. The tactical question is another matter, to be considered later.

Let us now examine the alternative course, actually adopted by Rodjestvensky. At 5 a.m., Togo at Masampho received by wireless telegraphy definite intelligence that the enemy were sighted, at a point designated 203 in the Japanese intelligence system, apparently steering for the eastern Tsushima channel. We do not know certainly where 203 is, but, since two hours later the Russians were again reported, definitely, as 25 miles northwest of Ukushima, and as their speed was twelve knots, we can calculate that at 5 a.m., they were 114 miles from the scene of action, 10 miles north of Okinoshima, chosen by Togo upon the basis of the information transmitted continuously by his scouts. Masampho is from 80 to 85 miles from the same selected point. By good scouting and intelligent choice of position, coupled doubtless, though not explicitly affirmed, with heavy boiler fires and all preparations for instant departure,¹ the Japanese could move on an interior line, shorter by thirty miles than that of the enemy. At nearly equal speeds of twelve knots, this gave the former two hours and a half to spare; while, for the Russians to overcome this disadvantage, they would require a superiority in speed of more than four knots, throughout the seven hours in which their opponents were covering their distance. Had the two equal speeds been fifteen knots, the advantage in time for the Japanese would have been two hours; they requiring 5 3-5 hours, their opponents 7 3-5. With this higher speed, the Russians, during the time taken by their opponents, would have needed to maintain a speed five knots greater than theirs, or twenty knots, to arrive coincidentally with them. Now, when speeds between fifteen and twenty are reached, nautical readers do not need to be told that, to make increases of four or five knots per hour with the same displacement, guns must be thrown overboard; not in the race on the water, but in the plans of the constructor. Fighting power must be sacrificed. In the light of such conditions what are we to think of trivial increases of speed, a quarter, or one knot, or even two knots of top speed, which is a very different thing from the working speed which naval operations will compel for the best aggregate results.

Togo thus, by good scouting and choice of position, secured beyond reasonable hazard his strategic object of bringing the Russian fleet to battle, irrespective of speeds. Certainly, his problem was much simplified by the Russians' difficulty in having but a single port of refit open to them. But the fair reply is that the two admirals, like all general officers, had to deal with the problem before them; and a glance at the map will show that, had Port Arthur remained Russian to the day of battle, *the fleet within being destroyed*, the existence of the two ports need have made little change in Togo's plans, a consideration which deepens the condemnation of those who could find for that fleet no better use than to sink it.

If superior speed can be shown to have had so little necessary effect upon the strategy of the campaign, how was it in the tactics of the battle? Owing to his sagacious choice of position, the Japanese admiral was able to appear directly across his antagonist's desired

¹ Togo's report reads: "The different sections of the fleet at once (5 A.M.) commenced their hostile operations along the lines respectively laid down for them in the pre-arranged plan."





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line of advance. He had headed him; not only in the usual sense of the word, but in acquiring intelligent knowledge and appreciation of the conditions before him. Any remarks on the tactics on the occasion would be incomplete, if mention were omitted of the advantage obtained by a thoroughly up-to-date system of scouting. I infer, from casual mention, that the field of sea over which the enemy would probably approach was divided into squares, to each of which a number was given. Of these, 203 was one. Wireless telegraphy speaks for itself. The system was better than that of a century ago, simply in so far as means have been developed; now, as then, antagonists may be on equal terms. It depends on themselves. There is no indication that Rodjestvensky knew anything certainly of his adversary's position, or dispositions, before the battle-ships came actually in sight. Togo, on the contrary, notwithstanding a haze contracting the horizon, "was able, before I could see the enemy with my own eyes, to know that the enemy's fighting sections comprised the whole of the second and third squadrons; that they were accompanied by seven special service ships; that the enemy's ships were disposed in a double column formation; that their strength was placed at the head of the right column, with the special service ships at their rear; that the enemy's rate of speed was about twelve knots; that the enemy were continuing to steam in a northeasterly direction; and so forth." Any change that might occur from moment to moment would be equally transmitted. He was thus able to decide, not only the point at which he would fight, but his dispositions for action. The Russian may be said almost to have been taken by surprise. If he had available scouts with him, they should have been far enough in advance of the main body to preclude observation, by driving off the enemy's lookouts, so as at least to insure equality of time for intelligent preparations. Togo's outer scouts, the ones which sighted the Russians at 5 a.m., were over a hundred miles from Masampho. It is interesting to remember, and illustrate results as compared with a century ago, that the leaving Cadiz by the allied fleets before Trafalgar was known to Nelson, fifty miles at sea, two and a half hours after the operation began; a period perhaps shorter in relation to power of movement than the results of to-day.

To return to the question of speed as affecting the battle. Togo reported that, his fleet having assembled at noon ten miles north of Okinoshima, he first sighted the enemy at 1.45 p.m., a few miles to the south. Let us interpret "south" literally; due south. The assumption is permissible; for reference to the simple geometric construction given above will show that, with the Russians bearing anywhere between S.S.E. and S.S.W., Togo retained the shorter line of operations, granting merely equal speeds. The Russians, being by this hypothesis due south, and steering northeast, it is plain that should Togo steer east—which for battle he did—he took one perpendicular of a right angled triangle, leaving to his opponents the hypothenuse. The other angles being 45 degrees, the distance they must traverse to reach the point where the two courses intersected, was nearly one-half greater than his. If his speed were ten knots only, they must go fourteen, merely in order to arrive together; while with equal speeds, if he took thirty minutes, they would need forty-two. It will be noted, also, in virtue of these shorter times, that if Togo continued to the point of intersection, he would be directly ahead of the enemy, and only their bow guns would bear; whence it follows

that, since he bore from them 45° forward of the beam when they were due south, as he advanced he would bring them more and more behind, throwing most of their battery successively out of bearing. To this doubtless was due the Russians keeping away, even before they opened fire; many of their guns at first scarcely bore properly, and, should they continue, would not bear at all. Having in view the Russian object of reaching Vladivostok without fighting, escape from the dilemma was hopeless, on any terms of speed likely to be found between two battle fleets. This will be shown further on. Under the particular circumstances there were but two alternatives: a charge direct, in line abreast, upon the Japanese fleet, trusting to breaking through in a *mêlée*, and some of the faster vessels escaping; or else to accept a formal pitched battle, by keeping off to insure the full play of their batteries. This was what was done actually, though clumsily; for the double column, with which the Russians ill-advisedly went into action, could not quickly develop the full power of the broadsides. It is ill performing under fire manœuvres which should be accomplished before. This process of keeping off had, of course, to be continuous to preserve the bearing of the guns.

I have said there was no escape from the Russian dilemma. To get to Vladivostok without fighting was impossible under any probable conditions of speed in the battle-ships. If instead of heading off gradually to keep the broadsides in play, the Russians had at once steered east, parallel to Togo, they would with equal speeds have achieved no advantage. To keep off farther, bringing him abaft the beam, would impose upon him the greater distances; but such a course would be but the beginning of running away, of a stern chase; and to realise its complete benefit their backs must be fairly turned on Vladivostok, in full retreat. Such a course would have been less acceptable to Togo; but the issue would have been to bring out a condition too often disregarded by even professional men, though all know it. Squadron speed is not an average; it is the speed of the slowest. Consequently, when one party runs away, there will be among the vessels of his antagonist some which possess more than the equal speeds we are assuming. These take up the chase, and by their greater swiftness bring to action the rear vessels of those in flight. The others must either turn back to support them, which brings on a general action; or, using their own superior speed, escape, leaving a partial victory to the enemy. But if unable to fight before, much less will they be able after such losses.

To anticipate Togo, under the courses the two combatants were steering immediately before the action—east and northeast—the Russians required a speed greater by one-half. If he went ten knots they needed fifteen; if twelve, eighteen. No professional opinion on either side of the controversy, I presume, will say that such differences are anywhere, or by any one, considered. The gains in speed, achieved by successive increases of tonnage or of engine space, at the cost of greater expenditure to obtain size, or of fighting power to increase speed, are much smaller. Let us suppose that the Russians had a fleet-speed superiority of two knots. By steering a parallel course, should Togo permit that condition to continue, they would draw ahead at the rate of two miles an hour. In five hours this would be ten miles, during which, assuming twelve knots for the slower fleet speed, the faster will have run seventy, the distance of the nearest shore. It then has to turn north towards Vladivostok,

with its slower opponent approaching to traverse its course by means of its faster vessels. It may be objected that the proximity of land, being particular to the instance before us, is foreign to the general discussion. The reply is that all safe generalisation is based upon numerous instances, and this is one; but further, as a matter of general experience, it is quite as likely that the slower fleet will have some ships equalling or excelling the fleet speed of the faster, as that the fleet speed of that faster body will be two knots greater than its adversary's. In the particular instance, the Japanese did have the two or more knots superiority, due to the particular cause that, being in home waters, they had been recently docked. Had conditions of speed been against them, instead of favouring them, doubtless Togo would have modified both his strategy and his tactics. Now if Togo's actual superiority of two knots speed, due to the nearness of his home bases, gave him no determining superiority which he was not equally able to obtain, and did obtain, by good strategy, it may fairly be asked would it have been worth while for the Russians, at the time of meeting, to have had two knots greater fleet speed, purchased by the sacrifice of gun power; to achieve the mere result of running away, with such doubtful chance in their favour.

Before summarising a conclusion, let us note one prominent feature of the battle of the Japan Sea, commonly to the partial engagement of the previous 10th August, the bearing of which upon the question of speed seems to me to have engaged little attention. One of the frequent incidents of both actions is the damage to funnels, either complete destruction or large perforation, destroying or diminishing draught, and with it speed. If the battle-ships keep together, which, as a rule, they should, the fleet speed is reduced at once to that of the injured ship. This factor does not come into play in the movements which precede the action, but it may seriously affect conditions of flight and pursuit, as also the power conferred by superior engine development in subsequent operations by fleets distant from their means of repair. The loss of a modern funnel will be like the loss of a former-day lower mast. Certainly, no discussion of the utility of speed obtained at the sacrifice of gun power can be adequate, if it does not take full account of this specific result, which has also a further bearing. The funnels are open to serious injury by guns of that secondary battery, six to eight inch, which there is now a tendency to discard. It has long been my own opinion that the so-called secondary battery is really entitled to the name primary, because its effect is exerted mainly on the *personnel*, rather than the material of a vessel; and I am glad to find this view supported by the author of the article in *Blackwood*, though he does not use the same words. Whatever the improvements in quickness of handling 12-inch guns, it can scarcely be that, with an equal aggregate weight of broadsides, they can rival in volume of fire the much greater number and more rapidly discharged pieces of smaller calibre; and, when within the limits of useful perforation, volume of fire, multiplicity of projectiles, is better than individual weight of projectile, because it gives a greater number of hits. But under any useful construction of battle-ships there cannot fail to be important parts vulnerable to the smaller calibres.

There are other points of view from which the experiences of the Battle of the Japan Sea throw suggestive light upon the question of primary and secondary armaments—so-called; but it is best first

to summarise conclusions in the subject of speed, with which we have been consecutively dealing. First of all, it must be remembered, and repeated, that no one maintains that increase of speed, even a quarter of a knot, is not a desirable thing; or that greater speed, even to a small amount, is not of value, strategically and tactically. What is contended is that speed at its best is a less valuable factor in a battle-ship than fighting power, and that it is subject to more serious deductions, unavoidable and accidental, than fighting power is; and that for these reasons—original inferiority of value and greater uncertainty of maintenance—it must be kept severely in its proper place of subordination in the design of battle-ships. If we could assume a standard battle-ship,—and nothing condemns the assumption of an ideal as useful to reasoning,—a ship in which fighting qualities, speed, coal endurance, and all the rest, were realised in perfect proportions, we would say that any increase of speed obtained by improved processes of engine-driving was a distinct advantage, but that the same increase, if obtained by sacrificing gun power to greater engine space was a disadvantage. Again, granting such a ship, we would say that to obtain increase of speed by increasing the size, whether the proportion of gun power be maintained or not—though especially if not—is also a mistake; for it means one of two things: fewer ships, or a larger national budget. Practically, the navies of the world have now committed themselves to solving their problem by progressive increases of size, which affects national expenditure in two principal ways: first, increase of cost by bigger ships, and, second, by prematurely relegating to the dump vessels good in themselves, but unable to keep up with the one last built. To-day's "Dreadnought" has no immunity from the common lot of all battle-ships. In a fleet, to-day, her speed will be that of her slower sisters; more "Dreadnoughts" must be built to keep up with her; and upon them in turn, according to the prevalent law of progress, she will be a drag, for her successors will excel her.

This wilful premature antiquating of good vessels is a growing and wanton evil. It is true, indeed, that this obsolescence is more in idea, in crude impression, than in fact. The vessels thus outstripped and outclassed remain immediately serviceable for places in the fleet, as well as for detached minor duties; but the inferiority to which they are successively dropped is different in kind from that of the old 74-gun ships, as contrasted with the three-decker. These were a permanent recognition of the fact, elicited by constant war experience, that a medium class of vessel was the best constituent unit for the composition of a fleet, which nevertheless could beneficially be strengthened at certain points by heavier batteries. Our present condition is that of abandoning all attempt at a guiding conception of types, or standards, except the crude one that each ship must be bigger than the last. The ultimate tendency of this, of course, will be to make ships after too short a time unequal to a place in the line. The moral effect is still worse, for it is inducing, in the navy as in the public, a simple trust in bigness, and, what is worse, an absence of trust in anything but bigness. Undoubtedly if all other things—skill, courage, numbers, combinations, fortitude—are the same on both sides, bigness, barring accidents, will carry the day; but when have all other things been the same? We are putting in the foremost place of consideration that which military history shows to be the least of several factors. We have, indeed, the proverb, that "Provi-

dence is on the side of big battalions;" but we know it is not true Napier is nearer the truth, in saying, that the presence of Napoleon on a battle-field was equal to a reinforcement of 30,000 men. Providence is most often on the side of men who best know how to manage their battalions, or their ships; the smaller have more often triumphed by their conduct, than the bigger by their weight.

The perforation of funnels, with the diminution of speed, is but one illustration of the very serious effect which may be produced by the secondary batteries; that may be expected from them. In the present incipient, but well defined, purpose to dispense with these batteries, it is well to note at once the reversion to the "Monitor" type, which had a day, was abandoned, and now seeks to return. The single turreted monitor was for its limited uses effective; when it passed beyond those limits, of still waters, and posed as a sea-going battle-ship, it showed deficiencies which excluded it from such a function. The single turreted monitor was logical; it gave an all-round fire for a battery fully equal to the capabilities of its tonnage, and so concentrated in space that about it could be accumulated all the armour protection the tonnage could bear. Having a very low freeboard, one that also could be adequately armoured; and as the vessel was intended for, and made its whole war record in, still waters, there was no rolling to expose the under water, unarmoured hull. Further, the prescribed proportion between tonnage and battery weight being that compatible with all-round fire of the latter, size was restricted in the individual ship, and numbers increased. This facilitated dispersion of vessels around a single object, such as a shore battery, giving dispersion of guns with concentration of their fire; a disposition which is easily seen to combine the least exposure of one's own force with the greatest effect upon the opponent.

The advance to the two-turreted monitor was not logical; the increase of tonnage did not give all-round fire to the increased battery; for a considerable arc of train each turret stood in the way of the other. One or more three-turreted monitors were built in the United States towards the end of the Civil War, when the vogue of the monitor type probably reached its highest; but they saw no service. As turrets were added, and size increased, the vicious tendency became obvious. Exposure was concentrated, and dispersion of pieces was sacrificed. The concentration in each turret of so large a part of the whole battery gave a maximum of exposure, which necessitated elaborate protection for the turrets; and from this necessity defensive armour assumed a preponderance of consideration in the minds of officers and designers, entailing a predominance of the defensive over the offensive, which is also the note of long distance action. This is the precise opposite of Farragut's aphorism, that the best defence is our own rapid fire; that is, offence. Such a mental attitude is so contrary to the teachings of history that it should at once arouse inquiry. Nevertheless, the usefulness of the first monitors diverted attention from their limited sphere of action, which it was attempted to transfer to the deep sea. Not for the first time, nor yet for the last, men were assured that we had a revolution in naval warfare; not only implements, but principles, had been subverted. The prepossession in favour of heavy straight-ahead fire, to which the broadside was to be sacrificed, and the emphasis laid upon the ram, contributed powerfully to this conclusion. Those who kept touch with naval tactics of twenty or thirty years ago will remember the influence

of these two ideas upon ship construction, and upon suggested fleet formations. Ingenious devices for increasing fire ahead were multiplied. A ship's side was broken into redans, and raised into stories for this object; while for battle purposes the line abreast almost superseded the line ahead. Both these dominant prepossessions have now disappeared. No attempt at ramming was made in the late war; while in practice the broadside has reasserted the superiority inseparable from the fact that a vessel, being five to six times as long as she is broad, can always deploy a given weight of battery more effectively along her side than across her beam. The one exception to this is the small monitor—not the big.

Small, slow, clumsy to handle, but with the utmost battery it could carry concentrated in two pieces which were substantially one, and with all-round fire, the single turreted monitor was the gun-boat of its day; the double turreted monitor was a degenerate from it. The "Inflexible" of the British Navy, launched, I think, in the seventies, marked the extreme and final development of this type. I have not references at hand, but as I remember she carried two turrets, each with two 16-inch guns; and many will remember the controversy as to the effect which injuries by gun-fire to her hull, forward and abaft the armour belt, would exert upon her flotation. While admitting that a certain degree of perforation might cause her to upset, it was justly argued that the amount of such injury that could be effected was an artillery question; which I apprehend was equivalent to saying that hits from a battery like her own, of a very few large guns, were likely to be too few to admit the dangerous amount of water. From this followed directly that numerous pieces, unequal to her armour, but equal to piercing her unarmoured extremities, might effect the desired injury, in whole or in part.

This conceded, there was cut out work for what are now called secondary batteries. For sea-going, the true monitor had proved hopelessly slow, and with any wave motion an extremely bad gun platform, owing less to the depth of the roll than to its excessive rapidity. Though demonstrated to be safe by several long voyages, notably one trans-atlantic, its general nautical qualities were poor. Low freeboard had to be abandoned, and the excessive metacentric height to be diminished in the interest of good aiming. There was thus induced a large superstructure, which, since the "Inflexible" period has been utilised for the placing of the so-called secondary batteries, ranging from 4-inch to 8-inch guns, and above. Their number and rapidity of discharge constitute a great volume of fire, destined for targets such as the "Inflexible's" extremities—should such still exist—or other objects, such as the corresponding secondary batteries of an opponent. The question of adjustment between number of such pieces and the most effective calibre for the individual gun is one of detail, quite apart from that of the principle that such a battery has its approximate and important target in the enemy's vessel. If generally abandoned, that part of the mutual exposure disappears; but is there no other, not yet protected, perhaps not susceptible of protection?

In the Battle of the Japan Sea, the Japanese had in broadside 17 guns of primary battery; 16 of 12-inch and one of 10-inch; mostly, if not all, turret guns. It had also a total of 110 guns of secondary battery, in broadside. Of these totals, all the primary pieces and forty at least of the 6-inch guns were in Togo's own division, which

began the action, received the first fire, and apparently endured the brunt and inflicted the greatest damage. In this division alone the lighter pieces were to the heavy in the proportion of $2\frac{1}{2}$ to 1, and we may be justified in assuming that calibre for calibre there were at least four discharges of the secondary to one of the heavier, with the consequent probability of a proportionate number of hits. This estimate is the more to be accepted, because Kamimura's division, the armoured cruisers, which carried nothing heavier than 8-inch guns, certainly brought their fifty-odd into the contest; for the "Asama" of this class was forced for a time to withdraw, in order to repair injuries from the Russian shells. The volume of Japanese fire then amounts to 17 primary and some 90 odd secondary guns. With what result? The "Oslyabya" was sunk, by gunfire; the "Souvaroff" lost by gunfire a mast and two funnels, a disablement which permitted her to be torpedoed, so far successfully as to incline her ten degrees; the "Alexander III." and "Borodino" were also sunk by gun fire, or in consequence of it, for both went down before the night torpedo attacks were made. The "Orel," when brought into port, had the upper part of her forward funnel shot away, as also the muzzle of a 12-inch gun. We still need more definite and specific information, which, in the case of the sunken vessels, may never be had; but from the heeling of some, and the sinking of all, might naturally be inferred that shots penetrating near or below the water-line were a principal contributory cause. We are told, however, that owing to the weight of stores, ammunition, and coal on board, the armoured belts were submerged, and in consequence the hulls at the water-line, and close above, were easily penetrable. I own to some perplexity as to how this should arise, from the reason specified, when so near the point of arrival, and so obviously improper with battle imminently probable. If such submersion existed, as the preponderance of evidence goes to show, it seems more likely due to a circumstance stated by Captain Klado, of the Russian Navy, in his "Battle of the Sea of Japan," advance sheets of which I have been permitted to see. He states that several armoured vessels of that service were terribly over-weighted, the displacement exceeding that intended, so that the belt of thickest armour did not rise two feet above the water. The displacement of the "Souvaroff" should have been 13,500 tons, whereas, in fact, it exceeded 15,000. Granting the fact of submersion, to whatever due, it nevertheless appears from the sea conditions of the battle that, under usual and proper conditions of submersion, rolling may frequently be so heavy as to expose continually unarmoured bottoms, while yet not so extreme as to preclude decisive fleet action. Can the armour belt be continued to the extremities, bow and stern, of such thickness as to exclude secondary batteries, and at the same time of such depth as to provide against the exposure of the bottoms by rolling? and, if so, will the gain of defensive strength compensate for the weight thus deducted from offensive purposes? Against such a target, penetrable to all guns, volume of fire is of the utmost importance; for, while the aiming may be all of the best, the opportune moment of the shot's arrival, when the bottom is exposed, is beyond the control of the aptest gunner. In so far the effect is chance; and favourable chance increases with numbers or volume. Further, as stated by Sir William White in a recent lecture, the Russians declared they were blinded by the volume of shells from the Japanese guns. This result being

upon the *personnel*, goes far to establish the actual superiority of the secondary battery, in which the Russians had little more than half the number possessed by the enemy; while in the heavier calibres they had more than double.

The disposition to revert to the monitor type by discarding secondary batteries is the composite result of two prepossessions: in favour of high speed and of distant action. The latter is to be enforced by the combination of superior speed with guns, the effective range of which is insured by great size; by heavy calibre. By my greater speed, be it but a fourth of a knot, I shall maintain a position where my adversary's secondary battery can do no harm, while my own primary, outnumbering his in the degree obtained by sacrificing secondary guns, will destroy him. Superficially plausible, the argument is logically unimpeachable. The difficulty is that it disregards experience; not of its own proposition, indeed, for it has not been experimentally tried, but the experience of history. It is the old gun-boat theory, in one of its several incarnations; for, if the essential principle of design remain, a gun-boat is no less a gun-boat because a hundred times as big. Given a small number of long-range guns, take a position suitable by favourable range, and within the dead angle of the enemy's broadside, utilising a calm or shoal waters; and behold the hostile frigate disabled and captured.

I do not think the parallelism of principle is here overstrained. The dominating considerations in the two arguments are identical, though it must be admitted that the qualifying factors are somewhat different and may affect the practical issue now. In the case of gun-boats, always presumed to be provided with guns of the heaviest calibre, history has recorded its verdict. To-day the decision seems to turn upon the question whether the primary batteries, under all conditions which admit of fleets engaging, can make efficient practice at ranges which will prevent the secondary guns of the enemy from perforating the funnels or exposed bottoms. This analysis concedes superior speed to the fleet which has discarded secondaries; but it is needless to say that, unless the distance taken does insure the immunity of funnels, the fleet with the least volume of fire—without secondary batteries—is by all theory of probability the one most likely to lose speed by the fallen funnel of a single ship. It is to be observed, also, that the great distances proposed do away with the advantage of the flat trajectory—the point-blank of to-day—in which the heavier guns excel the lighter. Recourse must be had to elevation of guns, with which, against a target of horizontal extension, such as a ship's hull, errors of aim increase in accelerating ratio. All naval men know full well the “good line shot, but over,” “or short;” a shot, in brief, that has missed its mark through vertical deviation. The grouped funnels, three or four in number, of the modern fast battle-ship, offer on the contrary a vertical target, one the least often missed by the average gunner, who usually shoots straight, but errs by too high or too low. In South Africa, I have heard that the Boer fire lost immensely in effectiveness, when instead of level they had to fire down hill. Of course, the funnel development of two fleets may be assumed equal; but the question posed is the effect of volume of fire. Both, too, may be assumed equal in exposure of the underwater bodies; but inferior volume of fire carries with it increased probability of being oftenest hit.

But, if this estimate of probabilities be deceived, as chance may very well occasion, and the first ship to be disabled belong to the fleet with secondary batteries, what will the other fleet do? Close, for decisive action? It then sacrifices the very advantage supposed inherent in the longer range, heavier gun; for the ship thus disabled is by no means necessarily a ship lost to fighting, and the battery power of her fleet may have undergone no diminution. Her fleet too has every reason to wish to close; and, therefore, in the contrary event of the first ship reduced as to speed being in the fleet that wishes long range, the opponent will close at once, and can close, because the hostile speed is reduced to that of the slowest ship. All this, which is irrefutable, goes to show that the fleet which has thus placed its dependence on long-range fire, has with it assumed the moral tone and temperament associated with the indisposition to close. An advantage gained cannot be improved, unless in itself quite decisive; a disadvantage which merely reduces its speed is, on the contrary, already a check, a moral as well as material defeat, which subjects it to the disaster of close action, less favourable to itself than to the opponent, the power of whose guns increases with approach. I do not wish to lay undue stress on moral forces, undeniable as is the effect of habitual action, or prepossession, upon moral strength; but I think appeal can be made confidently to history that the navy which, for any reason, habitually seeks to keep its enemy at a distance, in order to secure a preliminary advantage, usually fails to achieve more than a defensive success for the occasion, and in the long run finds itself brought to battle at an unexpected moment, under conditions unfavourable to it, both materially and morally. "Close" undoubtedly is a relative term; but, however extended or contracted, it can scarcely at any period mean farther than nearly the point-blank range of a ship's principal battery.

Among the many factors—such as armour protection and coal endurance—which enter into the efficiency of a battle-ship, speed and offensive power—gun power—are at present the leading competing considerations. The proper adjustment of all, allotting to each its exact proportion of the available tonnage, constitutes a problem of no small difficulty, and is not infrequently characterised as a compromise. One cannot easily recall all the loose expressions one may at various times have carelessly uttered, and it may be that I have myself used the word in this connection; but long ago I have adopted, as my view of military compromise, an absurd story I once heard of a dispute between man and wife, where they should spend the summer. He said Newport; she Saratoga; they compromised on Saratoga. The adjustment between the two necessary qualities of offensive power and speed for battle-ships may be called a compromise; but it should always be on offensive power.

What do you mean by this vague definition? I mean, primarily, the cultivation of the mental attitude which keeps offensive power in the foreground; a steadfast prepossession in favour of its immortal superiority. I should say next, a studious consideration of how far differences of speed really matter strategically. Control of the sea being the leading object of naval war, and strategy being more conclusive than tactics, what probable advantage does a fleet obtain by arriving ten days sooner, if it must get behind batteries on the coming of an opponent who has preferred offensive power to speed? Again, remembering that for a fleet the speed is that of the slowest, and

taking into consideration the incidents of naval war service, is it not probable that there can be determined a very probable serviceable fleet-speed for navies, than which two knots, more or less, at a given moment, will not greatly matter? That the Russian fleet, despite all disadvantage of heterogeneous units, of the long cruise, and protracted anchorages, without docking, was maintaining, on 27th May, a fleet-speed of at least twelve knots, while the Japanese seem not to have used more than fifteen, may afford some initial indications. No one is contending for no speed; but there are those who contend that speed is merely for bringing offensive power into play; that when it exceeds this, and expects to achieve success by running, it has small object, for the sea does not habitually, nor often, present positions at which, by anticipating an enemy, you achieve strategic effect. It sometimes does, but the rule is otherwise; and in the exceptional cases the observance of strategic considerations of position and interior lines will often, as in Togo's recent action, accomplish quite as much as higher speed. In short, at sea, speed falls within the province of evading the enemy; offensive power within than of crushing him.

The question of primary and secondary batteries also is not one of compromise, except as defined above. The one or the other must have its superiority admitted, and the inferior be discarded or duly subordinated. As this question supposes the fleets in presence, it is tactical, not strategical. I have already advanced the arguments in the matter, and now will only draw attention to the fact that here again speed, being an essential feature of ships that are to abandon secondaries, entails, necessarily, and avowedly, evading, keeping at long range; a system which never has worked historically. In tactics also, as in strategy, superiority of speed may be more than compensated by dispositions on the ground, as I hope to have illustrated by the incidents off Tsushima. Just at present, however, speed is continuously being gained without apparent sacrifice of aggregate gun power, by the simple but ruinous procedure of increasing size indefinitely; had still more been gained by sacrificing gun power, as in the armoured cruiser, there would have been increased necessity of evasion.

The ever-increasing size and startling cost of the battle-ship brings us also face to face with the opposing considerations of numbers and reduction of expense. That the relative cost of the larger ship is less than that of the smaller, that expenditure increases at a smaller ratio than tonnage, as stated, only partially qualifies the fact of the absolute increase, and does not at all modify the ultimate effect upon the numbers of the fleet. Budgets not being illimitable in size, there results between numbers and individual cost of ship an opposition, in the adjustment of which, as in that between speed and offensive power, there should be no compromise. The superior claim of the one or the other should be admitted; and when admitted, enforced in practice. A nation with wide naval responsibilities must have numbers in proportion; and this consideration is greatly reinforced by another, advanced before this war and confirmed by it, that naval war henceforward will be marked by greater losses of material than of *personnel*; that reserves of ships will be more needed than reserves of men. The exigency of renewing coal supply works in the same direction. When not able to coal in the open, ships must be more frequently sent to the base to re-coal. This means a greater number

of ships in order to maintain a given minimum on the cruising station. The bigger and fewer the ships, the greater the proportionate loss when one goes into port.

In most matters of dispute a concrete illustration is worth many words, and in this matter of compromise we have such in the armoured cruiser; a true compromise, if ever there was one. The very words "armoured" and "cruiser" are in direct opposition, as one might say "heavy light cavalry." The type discards unity of design, and deliberately embraces a double purpose. A cruiser should be like a bird of prey, of strong wing and rapid flight, which seeks not equals, but inferiors. The cruiser, whether for scouting, or for commerce destruction, or the carriage of messages, needs swift and long continued motion; that is, speed and coal endurance. As these two qualities should, in the battle-ship, be—not ignored—but subordinated to fighting power, so in the cruiser gun-power and armour are to be subordinated, and in the main discarded, so long as they interfere materially with the essential unity of design, to which speed and coal endurance both contribute. I am particularly glad to use this illustration; for it will serve better than any elaborate protest to show that opposition to the present breathless increase of speed in battle-ships proceeds not from any depreciation of speed as such, but from the conviction that in every class of naval vessel there should first of all, and first and last, throughout her design, be the recognition of her purpose in war. All other necessary qualities should be regarded as merely ministering to this one purpose, which in battle-ships is offensive power exerted in fleets, and in cruisers long continued speed, in vessels meant to act for the most part singly. As to numbers of cruisers, no fleet ever yet had enough of them, to scatter wherever needed.

CROMWELL AS A SOLDIER.

By Captain P. A. CHARRIER, h.p. (late Royal Munster Fusiliers).

Thursday, 26th April, 1906.

Major-General Sir J. F. MAURICE, K.C.B., R.A., *p.s.c.*, in the Chair.

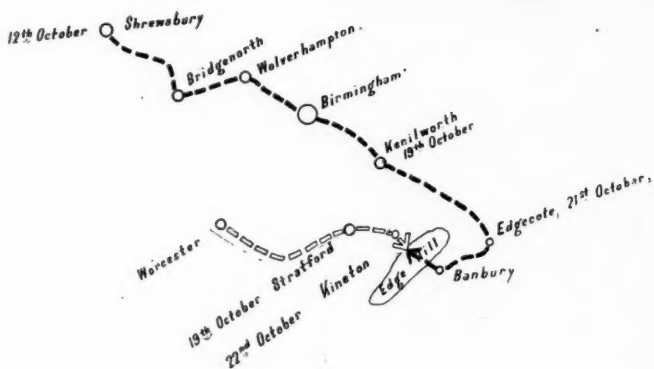
SOME time ago somebody asked me where Cromwell had learned about war, and I told him I did not know. Most of the writers who have written on the subject take the view that he suddenly at the age of forty-three developed into a great genius. Now, it is an extraordinary fact that all the great leaders mentioned in this world, before starting on their careers, have been through a thorough education in order to fit them to carry on war successfully. Cromwell was surrounded by many men who had made war in different parts of Europe; but those men need not necessarily have taught Cromwell very much. For instance, about thirty-five years ago, when the French fought the Germans, we saw a French army, all the leaders of which had fought in the four corners of the world — in Algeria, in the Crimea, in China, in Mexico, and in Italy, so that they had had plenty of war experience; but they had not studied war, and they were beaten by a nation who had only studied war and not had much experience of it. Therefore, I do not think it is likely that Cromwell could have got very much information from the old soldiers around him; they might have taught him some routine and a certain amount of drill. They probably taught him, if he was of an enquiring mind, how not to do it.

On the other hand, all writers are agreed that he was a man of character, full of decision, full of energy, full of initiative, full of self-control, of perseverance, of capacity for prolonged efforts, of endurance and strength of body and strength of mind. These are all the characteristics, when allied with knowledge, that make for success in all walks of life, whether soldiering or any form of human activity.

I do not intend to go into the political side of Cromwell, but only to discuss him as a soldier, and therefore I will ask you kindly to look at some of these plates, which, perhaps, will make it easier for you to follow what I have to say. In 1642 the battle of Edge Hill was fought. At the beginning of October the King's army was at Shrewsbury, and the Parliamentary army was at Worcester. The honours of war were decidedly in favour of the King. His troopers had already managed to defeat a force of Puritans. The King's Council settled upon marching on London

1642.

Nº 1.



----- Royalists March
 Puritans March

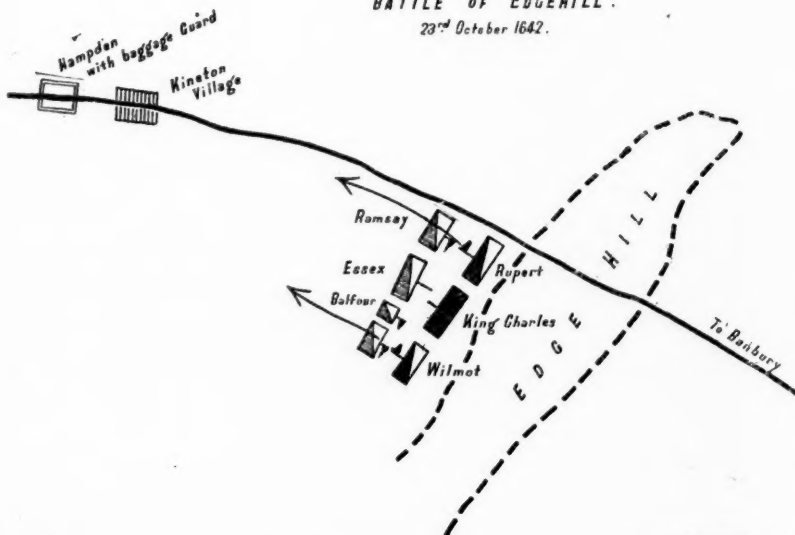
LONDON



Cap^t P. A. Charrier.

Nº 2.

Rough Sketc
 BATTLE OF EDGEHILL.
 23rd October 1642.



Cap^t P. A. Charrier.

and bringing the Parliament back to its senses. They started off, and had got as far as Edgecote. Essex, who commanded the Parliamentary army, was very dilatory in his movements, but messenger upon messenger coming from London he also moved off, and he reached Kineton on the 22nd October. Rupert, on the Royal side, had been foraging about Banbury. He heard that the Parliamentary army was at Kineton, and that night they held a council of war, and saw that they could not possibly persevere in their design on London, but that they would have to turn back and fight this undefeated Parliamentary Army. That brought on a battle with reversed front, which, if it had been decisive, might possibly have ended the campaign there and then.

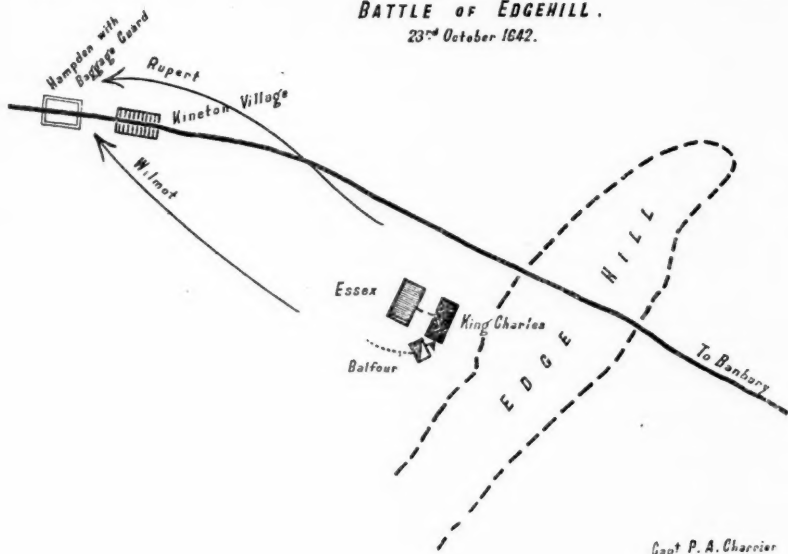
On the morning of 23rd October, 1642, the King's army fell in on the top of Edge Hill, and the Parliamentary army fell in at the bottom of the hill. You will see the position on Sketch No. 2—the light squares representing the Parliamentary army and the dark the Royal army. The Parliamentary army, not attacking, the Cavaliers moved down the hill, and having got into some disorder at the bottom reformed again. Rupert was on the right, King Charles in the centre, and Wilmot on the left of the Royal army. Rupert insisted on his men attacking vigorously and charging home, and he forbade them to fire either pistols or carbines. He attacked Ramsey. Ramsey's troopers did not come forward to the shock, but broke and ran. On the other wing Wilmot attacked and carried away a great part of Balfour's cavalry. In the centre King Charles's and Essex's infantry were in close contact and continuous fighting. They routed the Parliamentary troopers, who left the field, and Rupert and Wilmot went pursuing and plundering until they bumped up against Hampden, who was with the baggage guard just beyond Kineton.

Plate 3 shows Hampden with the baggage guard, and Rupert and Wilmot making for him. They were held up and driven back. Practically on the field itself there was nobody left except the Parliamentary infantry under Essex and the Royal infantry under King Charles, and part of Balfour's cavalry. Balfour's cavalry worked hand-in-hand with their own infantry, and the plate shows you them attacking the Royal army on the flank. It is impossible to tell what tactical ideas those people had in those days, but even there we see the germ of their future success; infantry and cavalry both present and both working together. Whilst Essex held King Charles in front, Balfour's cavalry attacked his infantry and rolled it up. Rupert and Wilmot then came back to the field, but their horses were so blown and the men so out of hand that although King Charles entreated them to attack again and decide the day, they refused to do so. However, their mere presence on the field prevented the Royal army being utterly defeated, and so the fighting broke up, and the Royal army retreated to the top of the hill, and the Parliamentary army did not follow. It was an indecisive battle. Cromwell was somewhere in that fight, but where he was is nowhere recorded.

During the next winter—1642-1643—Cromwell was in the Eastern Counties, and there he trained his famous Ironsides. The men were very carefully chosen, "no tapsters or loose, base, mean fellows" were allowed to ride in Cromwell's regiment. They were nearly all yeomen, accustomed to the saddle from boyhood, accustomed to fatigue, and knowing every lane and every portion of the country.

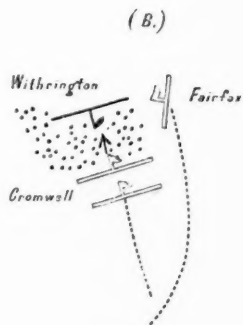
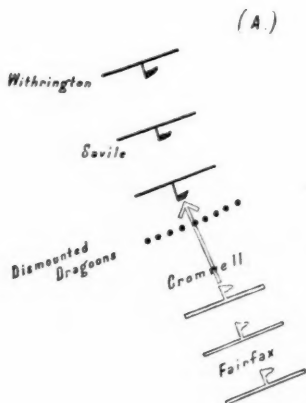
Nº3.

Rough Sketch
BATTLE of EDGEHILL.
23rd October 1642.



Nº4.

WINGEBY. 11th October 1643.



Capt P. A. Charrier.

They could all ride, not merely in the sense of being able to stick on, but in consequence of the roadless state of the country, they had been brought up to the instinctive feeling for that balance of a horse and rider which alone renders it possible to traverse broken ground safely and speedily and cover long distances without unduly exhausting either horse or man.¹ The horse was under the unconditional control of the man. That state of affairs existed because there were no proper roads in the country at the time, and all the yeomen had to travel about on horseback.

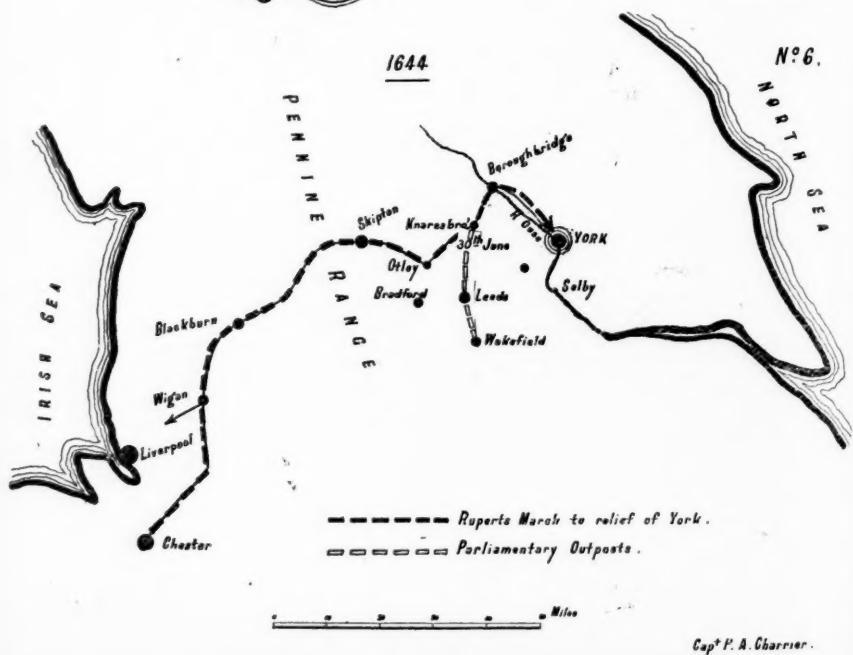
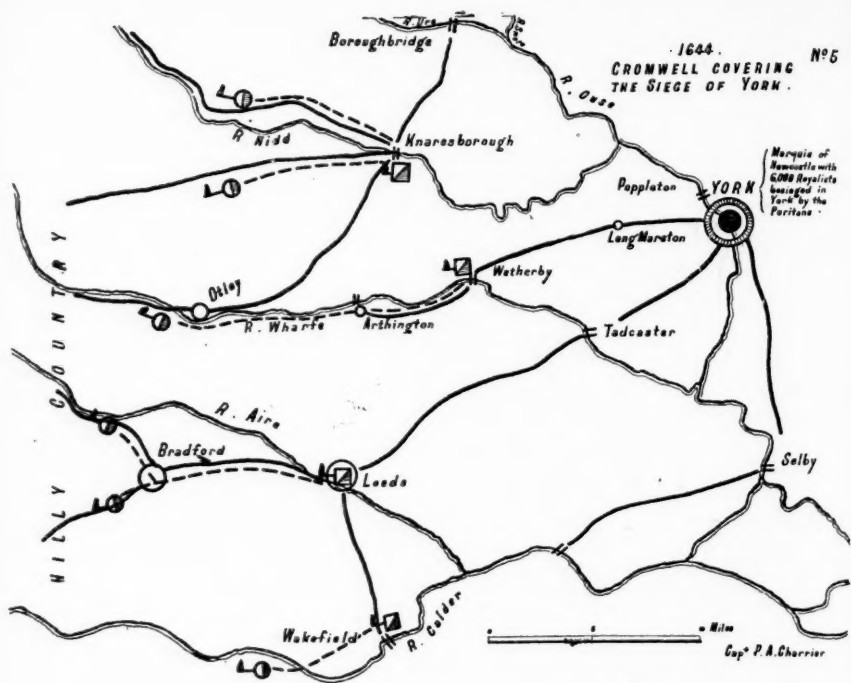
So that we see Cromwell taking great care in the training of his men. About that time, I think, there was a conversation between Cromwell and Hampden. Cromwell said to Hampden: "Your troops are mostly all dependent servants, wine boozers, and with a considerable amount of scum; those of the enemy are all independent gentlemen of rank. Can you believe that the spirit of such a rabble can compare with that of men who fight for honour with determination in their hearts? You must raise men of a spirit that will go as far as gentlemen, or you will be beaten." Hampden agreed with him, but did not know where such men were to be got. Cromwell did know, and in the 60 or 70 men of his troop he had the nucleus of men to be expanded in course of time by his diligence and energy and wisdom into a whole army.² The first encounter the Ironsides had was at Grantham, and after that there was the famous attack at Gainsborough, but I have not got pictures of that.

On Plate 4 we see what happened at Wincheby, where the Royal cavalry was formed up in three lines, Savile commanding the first two and Withrington the third. In front of them they had some dismounted dragoons. Cromwell's troops were also in three lines, the first two commanded by Cromwell and the third by Fairfax. The Puritans had dismounted dragoons there, too, but the dismounted dragoons evidently cleared the front. I do not know where they went to. Cromwell, having decided to attack, attacked, and Savile's squadron did not come forward to the shock; they went about and fled. They fled on to Withrington's line. Just about that time Fairfax, who had been following in the wake of Cromwell, came up on the flank and crashed into Withrington, and the defeated troopers of the first and second line. The cavalry combat demands that all efforts should be simultaneous. I do not know where Cromwell got that principle from, but he applied it there. He also attacked with the greatest resolution and in the closest order possible. His horse was killed by one of the dismounted dragoons and he was rolled over, but he mounted another horse and went on, and the whole affair was over in a few minutes. Nearly all the dragoons were killed or captured; they had not time to remount.

Later on, in 1644, the siege of York was going on. The Marquis of Newcastle, with about 6,000 Royalists, was besieged in York by the Puritans, by about 12,000 English and about 6,000 Scots. At that time the Scots were in alliance with the Parliamentary troops. It fell to Cromwell to cover the siege, and he put out his troops on outpost between Knaresborough, right away down south to Wakefield, on the Calder. Cromwell provided for safety two days in

¹ Colonel Maude.

² Colonel Baldock.



the dangerous direction, that is, in the direction from whence Rupert was likely to come, which would thus give the Parliamentary army plenty of time to make ready to meet Rupert's attack. On the 30th June Rupert established contact with Cromwell's troopers at Otley. In addition to the system of outposts that Cromwell had set up (shown on Plate 5), he also had some scouts under Watson, his scout master, and these people kept him thoroughly well informed of what was happening. When Rupert reached Otley they reported that he had 15,000 men, which was about the correct number. They also told him in what direction he was going.

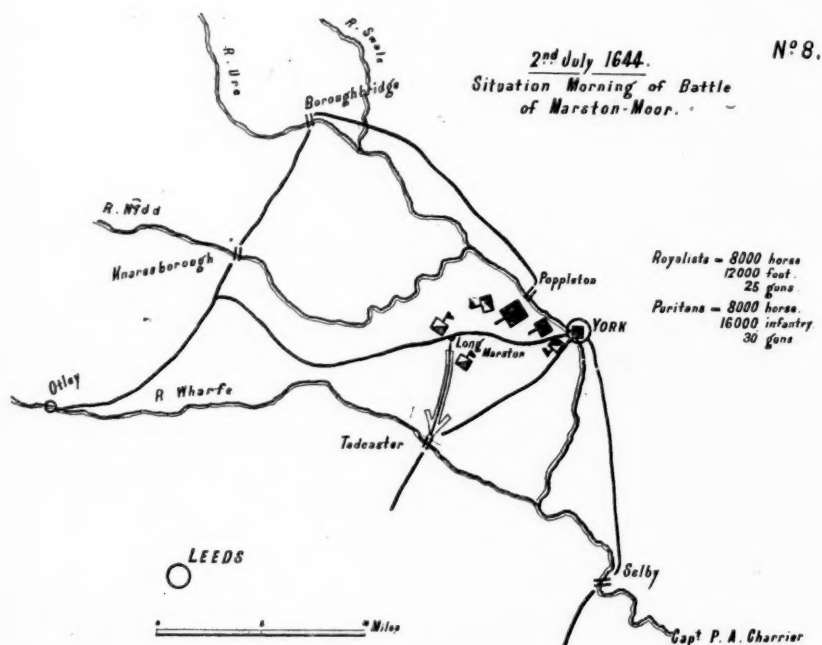
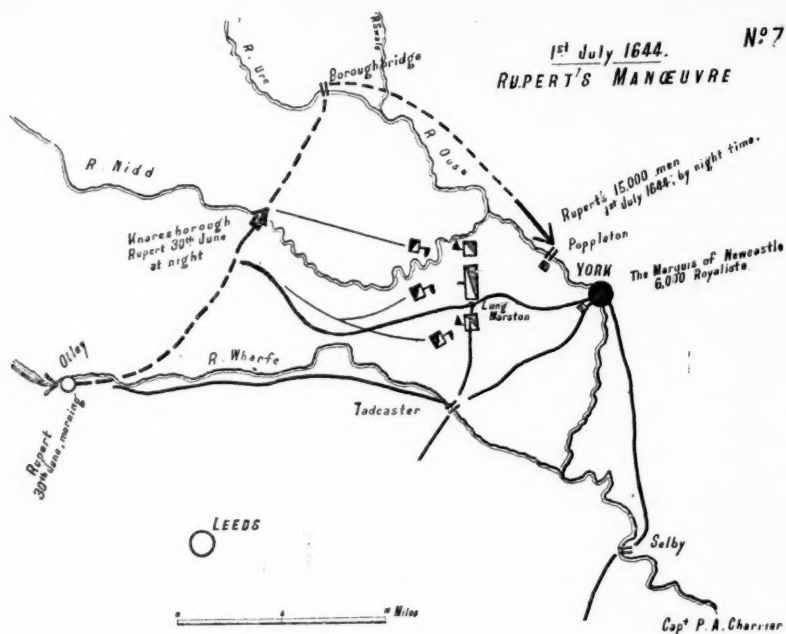
Plate 6 shows the march of Rupert to the relief of York. He left Chester, and somewhere in Lancashire picked up with another force of Royalists under Lucas and Goring, and came down by Otley. At Otley he got into contact with the Parliamentary troops, and from that moment they never lost contact.

Plate 7 shows Rupert's manœuvre. The Parliamentary force was drawn up by Long Marston, facing west, because they thought that Rupert would come and fight them there. Instead of that, Rupert sent all his cavalry towards Long Marston to reconnoitre and fix the enemy, and under cover of his cavalry he marched from Knaresborough to Boroughbridge, and right away down to Poppleton, where he defeated that little detachment of Parliamentary troops, and got into communication with the Marquis of Newcastle, and therefore now they had about 21,000 men together. That night the Royalists held a council of war, and made up their minds to fight. On the other side, in the Parliamentary army they also had a council of war, and they made up their minds to retire, intending to go by Tadcaster towards Selby.

Plate 8 shows the situation on the morning of the battle of Marston Moor. The cavaliers, having made up their minds to fight, were falling in just outside York. The Parliamentary army, covered by their cavalry, were retiring towards Tadcaster. Towards nine o'clock the advance guard of the Royalists got into contact with the rear of the Parliamentary army, and the Puritans sent word all along the retiring troops, and the generals of the infantry decided to come back and accept battle.

On Plate 9 you see the situation between four and seven o'clock in the evening of the 2nd July, 1644. The two armies were drawn up with the cavalry on either wing, and the infantry and artillery in the centre. They were separated by a very wide and steep-sided ditch, and neither side cared to advance for fear that in the disorder the other side would gain an advantage. They stayed on like that between four and seven o'clock, with slight cannonading on either side. It had been raining off and on all the day, and all the troops were wet. About seven o'clock Prince Rupert and the other Royalist leaders thought there was no likelihood of there being any fighting that day, and so they went off—not very far, but they went off to their coaches and started smoking and eating. The Parliamentary army were on the lookout, and Cromwell, seeing the opportunity of attacking by surprise, as the other side were off their guard, lighting fires, cooking, etc., took the initiative and started off, and the whole of the Parliamentary army fell to also.

On Plate 10 you will see Cromwell has crossed the ditch and attacked Rupert straight to the front, while David Leslie's squadron crossed the ditch a little to the right of Cromwell and fell on Rupert's



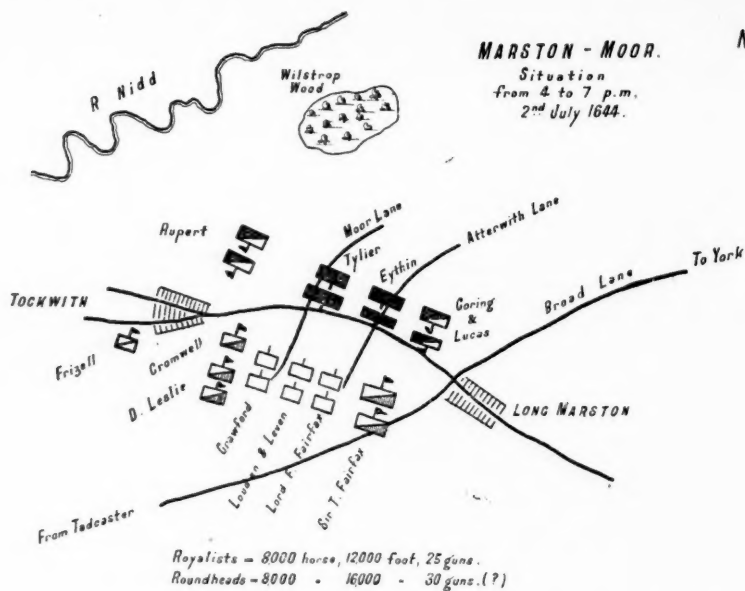
flank. Rupert's men had barely time to mount to meet the attack at speed, and they were over-ridden and defeated. Cromwell's infantry, the Eastern Association infantry, under Crawford, also crossed the ditch and attacked Tylier's infantry on the flank; the remainder of the infantry came into contact at the centre. Away on the right flank Goring and Lucas attacked Sir Thomas Fairfax's cavalry and defeated it, and then set off in pursuit.

On Plate 11 we see that Cromwell, who had defeated Rupert's troopers, sent in pursuit a very small fraction, just enough to keep the routed men on the run and prevent them re-forming. He and David Leslie's squadron re-formed as quickly as they could and set to attacking the Royal infantry, and rolled up regiment after regiment. On the other flank Goring, having defeated the Parliamentary troopers, set off in pursuit with the bulk of his men, and only left Lucas on the field. Lucas was not strong enough. He attacked over and over again the Scots infantry, but he could not make any impression on them.

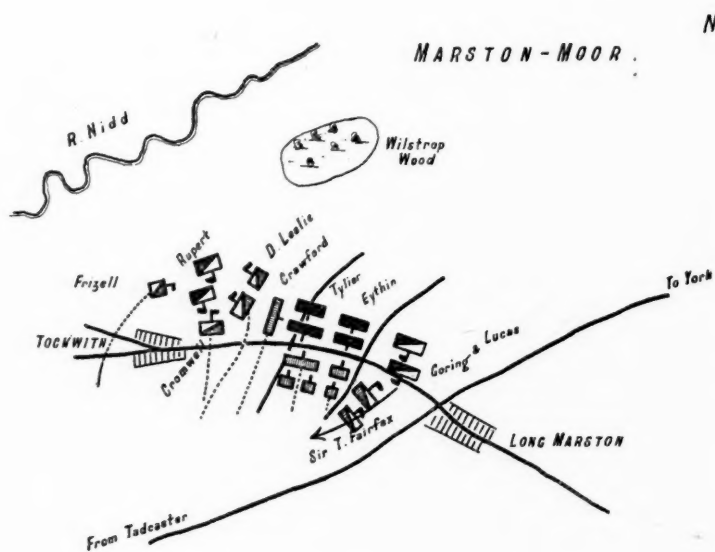
On Plate 12 we see Cromwell re-formed again, and we see Crawford attacking the Royal infantry in the rear, the remainder of the Parliamentary infantry being in front of them. Goring and Lucas re-formed and attacked Cromwell, but they got into difficulty over that ditch and were defeated by Cromwell's troopers, who were well in hand. It is preached in every war school in the world that the business of cavalry in battle is first of all to defeat the enemy's cavalry and after that to join in the attack on the remainder of the hostile army, hand in hand with its own troops. We see here, I think, in this battle that Cromwell had already solved those two duties. Lastly, the business of cavalry is to pursue. The battle here was over about ten o'clock at night, and they did pursue to within about three miles of York, when they were stopped by the Royal musketeers lining the hedges and by the darkness of the night.

In 1645 they started the new model army. The new model was merely an expansion of Cromwell's own system to the remainder of the Parliamentary troops. About the beginning of June the Parliamentary troops were besieging Oxford and many other places also. The King's troops had just captured Leicester, and the Parliament then got into a fright, and thought it was time to do something, and they therefore gave Fairfax a free hand, and allowed him to go on. Fairfax broke up the siege of Oxford and went off in search of the King's Army. A petition was got up to Parliament to allow Cromwell to come back as leader of cavalry. There was an Ordinance in which all the leaders, and Cromwell especially, were not allowed to go on until they had the leave of Parliament to do so. They applied to Parliament, and Cromwell joined them at Killingsbury, and all the soldiers said: "Ironsides is come to lead us," so that it was evident they were very glad he had come back. The King's army, marching by Market Harborough, got to Daventry, where they halted on the 8th to 12th of June. On the 12th of June Ireton's cavalry got into contact with the Royal cavalry, and did not lose the contact any more, but kept it right through, including the battle and right on to the pursuit, which ended at Leicester, after the battle.

Plate 14 shows the situation as it was on the night of the 13th-14th of June. It was the night before the battle of Naseby. Ireton's cavalry, at about half-past nine, attacked the rear of the



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Royal army at Naseby and drove them out of it. Fairfax and Cromwell were in bivouac about Guildsborough, and the Royal army were in villages and cantonments just beyond Naseby, right away on to Market Harborough. That night the Royalists held a council of war, and they decided to come back the next day instead of retiring any more, and give battle, and that brought on the battle of Naseby. On the 14th June, very early in the morning, Fairfax, who was commanding the whole of the Parliamentary army, left his bivouac. The cavalry had given him information that the Royal army were making ready for battle, and that they were forming up.

Plate 15 gives the formation that they were in, roughly, at the beginning of the battle. On the east the ground is much cut up by rabbit warrens, and on the west there was a very tall hedge and a deep ditch, behind which Oakey's dragoons were. The armies were drawn up in the formation they had in those days: the cavalry on two wings and the remainder in the centre. The Parliamentary army was drawn up somewhat behind the ridge—a long way behind—so as not to show their strength. They were about twice as strong as the Cavaliers, and of course they wanted to keep that fact to themselves, and that was the reason why they were drawn up behind; in fact, Cromwell says so.

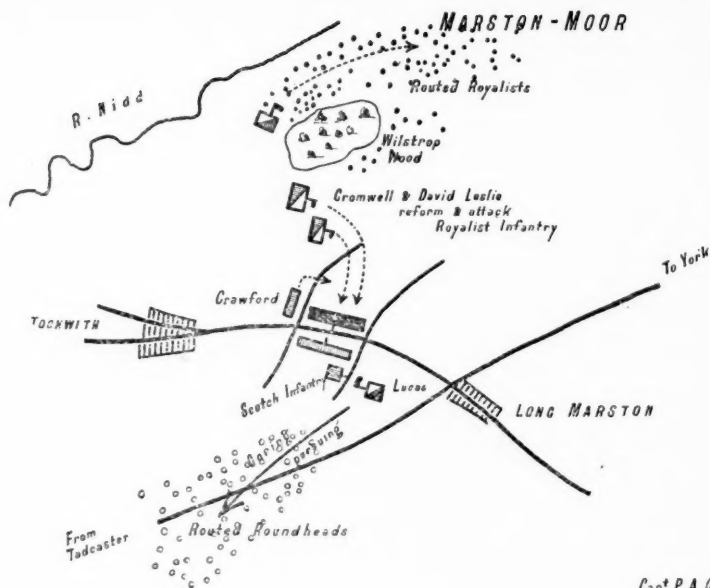
Plate 16 shows the Royal army advanced to the attack. The moment they saw the Royalists advancing the Puritans moved up to the edge, and the battle took place close on the edge of the plateau. Cromwell made up his mind to attack Langdale's cavalry, and Whalley attacked straight to the front in two overlapping lines, while Cromwell and Rossiter attacked Langdale on his flank. They defeated Langdale, and the defeated troopers fell on some of their own infantry, and the troopers were rolled up and fled. Rupert, on the other side, attacked Ireton exactly in the same way—in front and flank simultaneously. He suffered a little from the fire of Oakey's dragoons, but paid no attention to it. Rupert defeated Ireton, most of whose troopers fled. In the centre the two infantries and the artillery were fighting away.

Plate 17 shows Rossiter, who was fresh, pursuing Langdale's defeated troopers, and then we see Cromwell rallying just a little to the west of the gorse and rabbit warrens. Astley, who was commanding the King's infantry, and Fairfax, who was in charge of the Parliamentary infantry, were fighting away. On the other side we see Rupert, who had defeated Ireton's troopers, pursuing right along and down south until he came on to the baggage guard of the Roundheads, and started attacking them, but he was repulsed.

On Plate 18 we see that Cromwell was now attacking the Royal army in rear and also on their flank. Rossiter had rallied; Langdale was rallying all the men he could get hold of. Rupert, who had been attacking the baggage guard, was now returning to the battle-field. The Royal army was held in front by the Parliamentary infantry. You see Cromwell attacking them in rear and on flank, and rolling up regiment after regiment.

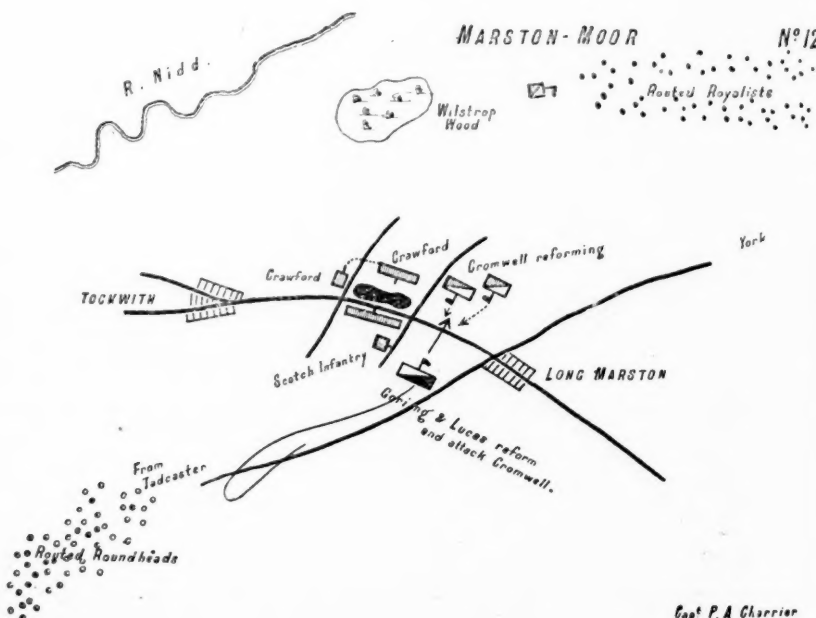
Plate 19 shows the last act of this battle. Langdale had rallied, and Rupert had come back to the field, but the whole of the remainder of the Royal army were defeated, and were flying as fast as they could. Rossiter was rallied; he was the last reserve Cromwell had. Cromwell was rallying, as was also Fairfax. Rossiter gave them the time to rally, because it takes some time to rally, and you must

Nº 11



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Nº 12



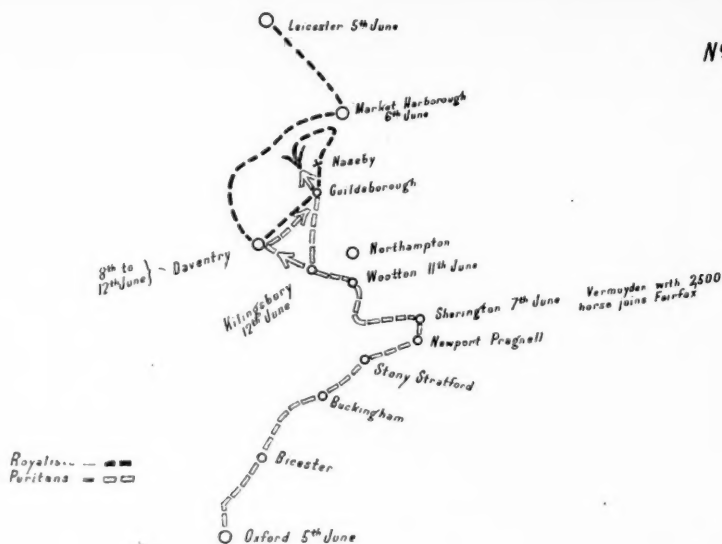
Capt P.A. Charrier

have fresh troops under the protection of whom you can rally. Then, when all was ready, Fairfax moved up into the line of battle, and they advanced again to the attack; but neither Rupert's Horse nor Langdale's came forward to meet it. They fled, and the pursuit went on right away up to the walls of Leicester—about fourteen miles.

This battle of Naseby reminds one of some of the old historic battles, like the battle of Zama, where Scipio defeated perhaps the most famous general of all time, Hannibal. There is no doubt about it; Napoleon told us the truth when he told us to read about all these great old warriors, for the principles on which they fought are true, and will be always true. It is a pity that he did not include Cromwell amongst the list of the great generals of all time; but then Napoleon was not very fond of the English. However, we see Cromwell again here solving the problem of a battle, and certainly solving the rôle of the cavalry in battle. First of all he defeats the other cavalry, and then he joins in the attack hand in hand with the remainder of his army, and lastly he pursues. Battles nowadays last a long time, but they do not last a long time because of the armament; it is not the armament that has made battles last three or four days or a week or a fortnight, but the huge number of men engaged. One can quite well conceive that if two men are fighting it out alone the fight will not last long. If you only have a small force of a few battalions and a few cavalry and artillery, the battle would not last long, and a decision would be come to very soon. But in the battles of the future the huge number of men employed will make battles last a long time, and it is a question whether the men's nerves will hold out as long. Therefore, in many war schools they are considering this fact. Nobody will deny, for instance, that infantry can attack infantry. If any of us here who are infantrymen were told to go and attack infantry we would go and do it, and if we were told to go and attack artillery we would go and do it. It surprises me to hear it said that cavalry cannot do that. Of course they can do it. They can travel faster than we can. It has always been the cry that cavalry cannot do this, that, and the other; as a matter of fact the cavalry can do any mortal thing they like if they have the determination to do it. I am an infantryman, but that does not matter; our cavalry are not going to attack us, they are going to attack some other infantry. On field days you will see umpires give decisions that are impossible. I myself have been very angry when I have been charged at a field day by cavalry, and I have said it was impossible; but I did not realise that they were British cavalry. I think it is a pity Napoleon did not include Cromwell amongst the list of the great warriors; certainly the very greatest cavalry leader in Europe in modern times. The Germans worked on his principles a hundred years afterwards. Frederick had the good fortune of finding men like Seydlitz, Trethen, Driesen, and a host of good leaders, and they must have studied Cromwell, I think. I cannot prove it, but I fancy they must have; at any rate, they brought cavalry to a tremendous pitch of perfection on the battlefield. Whatever that cavalry did was exceedingly fine, but the work of the cavalry at Marston Moor and Naseby has never been surpassed. Besides that, Cromwell used his cavalry strategically, and used it very well; but we shall see that later on.

Diagram No. 19a I drew up to give some sort of idea of what happened. They used to fall in six ranks deep, one horse length

Nº 13.



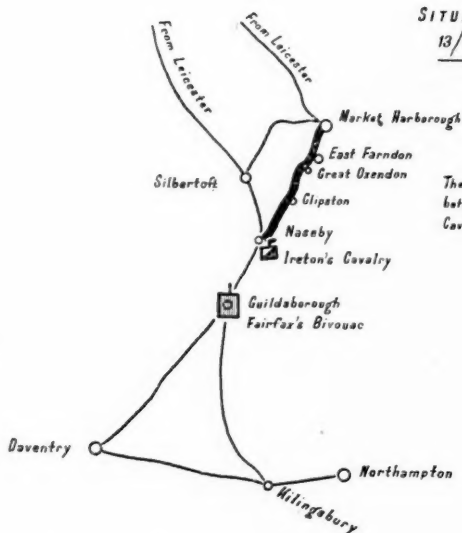
Cap^t P. A. Charrier

LONDON



SITUATION NIGHT OF
13/14th June 1645

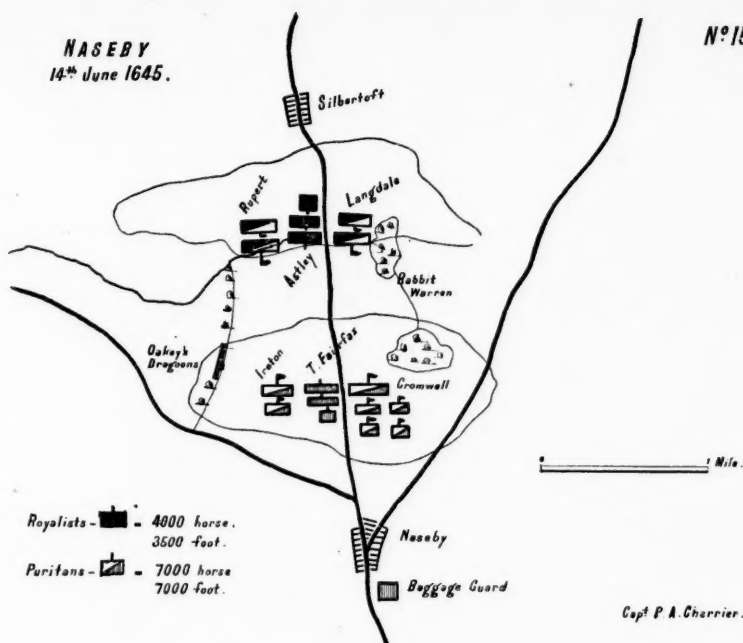
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NASEBY
14th June 1645.

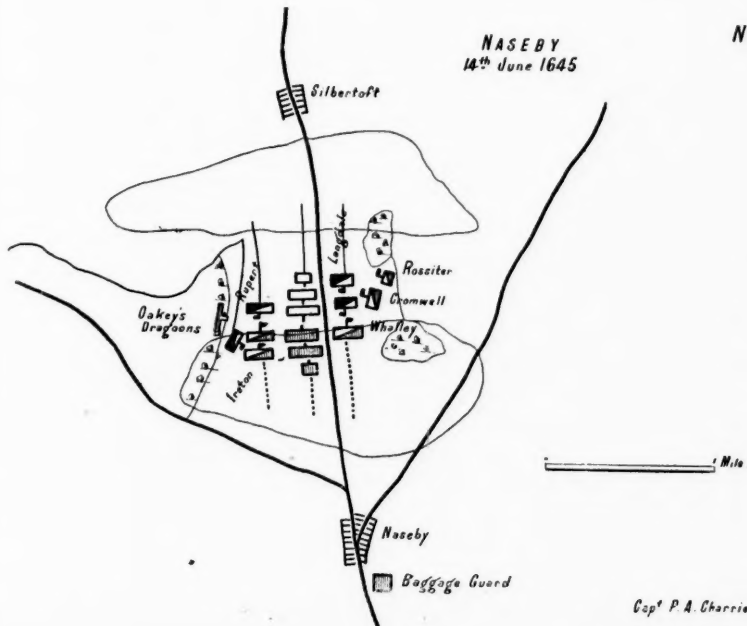
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Capt P. A. Cherrier

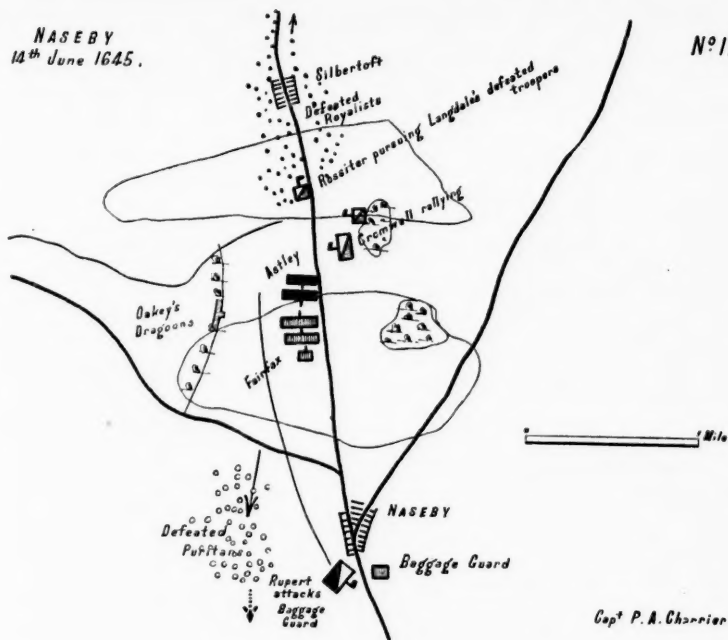
distance between ranks and one horse length interval between files. All manœuvring was done in that formation. When attacking, a line was formed of three ranks by the simple process of the men of the second, fourth, and sixth ranks moving up on the left of their own files in the first, third, and fifth ranks. As far as possible an endeavour was made to have no interval between squadrons in the attack. They rode in the closest knee-to-knee order possible. This gives a rough idea of what happened. Rossiter went to the right, and then head left wheel until he got to what he judged was the right place, and then formed "line to the left" in three ranks. The second and third lines did the same, files right, head left wheel. Cromwell dashed into Langdale's squadron on their flank, whilst Walley was attacking them in front. It is the most difficult task that cavalry can possibly have, not to attack infantry or artillery, but to attack and defeat its own arm of the Service. The enemy's squadrons of cavalry are also moving pretty fast, and it is the most difficult thing to lead an attack so that you can simultaneously bring it on front and flank at the same time. I think that was an extraordinary manœuvre—a wonderfully fine manœuvre.

Now we will come to an example of the strategic use Cromwell made of his cavalry. Many years ago there was a Roman army somewhere near Alesia, and the Gauls made up their minds to fight them. They raised a huge army and sent their cavalry on ahead, which was the right thing to do. The Gaulish cavalry came on, but the moment they saw the Romans, without waiting for their infantry to come up, they attacked and were beaten. A few days afterwards the Gaulish infantry came up, and they attacked the Romans and were beaten. The Romans beat first the cavalry and then the infantry in detail. The Gauls had no idea of the employment of the two arms in combination. For instance, the conception never crossed their minds that their cavalry should go ahead, and, having located the enemy, should wait until the remainder of the army came up. It is a most extraordinary thing that the same thing happened in France in the Hundred Years' War. For a hundred years the French were beaten over and over again, because they had no conception of how to work together—the men-at-arms and the archers. Each man fought for his own hand and in his own way, and the result was that they were beaten. The English knew how to play the game and work together. But eventually the English were turned out of France. The heroes of Agincourt were beaten by a girl of eighteen, whose mother wit told her the best thing to do when they met in the open field was to attack in front with the infantry and artillery, while she led all the cavalry she had on their flank. The English could not understand it. They had got into a normal way of fighting. It is a fact that a little girl of eighteen, the Maid of Orleans, conceived that idea.

In the beginning of 1648 the Scots made up their minds to invade England, and they gathered an army in the south of Scotland of about ten thousand Scots. All England was in a state of agitation. The fleet declared for the King, and this gave the Royalists command of the sea. Monro was raising a force in Ireland in the interest of the Royal cause, and the command of the sea enabled Monro eventually to come over and join in England. At that time Fairfax was besieging Colchester, and Cromwell was besieging Pembroke, and Pontefract was besieged by Rossiter. All over England there was tre-

NASEBY
14th June 1645.

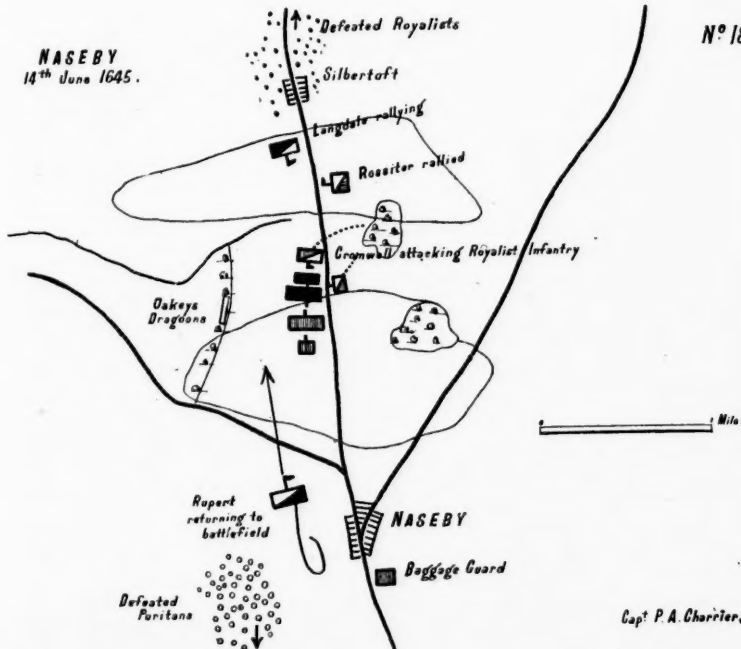
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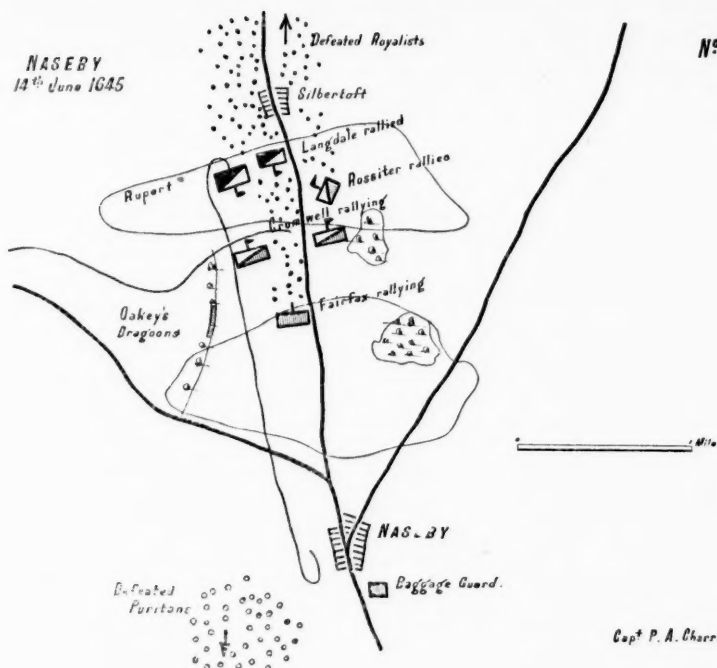
mendous discontent, and the Parliamentary outlook was pretty bad. In the north of England there were only about 2,000 horsemen under Lambert to meet this invasion. On the 8th July the Duke of Hamilton's army of 10,000 Scots crossed the border at Carlisle. At that date Lambert was in contact near Carlisle. He had also a regiment of horse at Hexham and some horsemen to the north of Newcastle, so that he was watching all the roads. Lambert was not a cavalry leader like the Gaulish cavalry leader; he knew quite well that his work was not to attack the Duke of Hamilton's army. Having got contact he fell back slowly, fighting, retiring, hovering on the flank of the invasion, and getting information to send back to Cromwell. So much information was sent that when Cromwell eventually came up he was thoroughly informed of where all the invader's troops were, and he was able to come to a decision and carry it out vigorously.

Plate 21 shows the situation one month after the Scots had crossed the border. Pembroke fell on the 11th July, and Cromwell marched off on the 14th July practically shoeless. His men had not been paid, and his troops were absolutely in rags, but he kept very good discipline, and managed to get along. He marched exceedingly well, considering the bad state of the roads. He got to Doncaster about the 8th August. If you will look at the plan you will see Lambert still in contact with the invaders, hanging about their flank, getting plenty of information, and taking care that he did not take a knock, because in this case there was no need for him to go out of his way to do so. He wanted to wait until all the troops came up, so that all the efforts could be simultaneous. Langdale, with 3,000 Englishmen, was covering the flank of the Scotch invaders, and was in contact with Lambert. Lambert never lost contact for a day or night; he hung on the whole time, following all the movements, and sending the information to Cromwell. Without this information armies move about as blind men, and it is impossible to make up one's mind or plan on conjectures or on hypothetical ideas. You must have information, and if you have not got it you must send someone to get it for you. The cavalry have to do that, and here they did it.

Plate 22 gives us the situation on the 12th August. On that day we see Cromwell at Wetherby. Lambert's cavalry was his direct advance guard at Otley. Langdale was opposing him at Cargrave and Skipton. The Duke of Hamilton had been reinforced, and his force now amounted to 17,000 men. Monro was somewhere between Sedborough and Hornby with 3,000 men. They were then in three groups. Cromwell had extraordinarily good information from Lambert. Lambert had told him that the Duke of Hamilton's army were marching on the road between Lancaster and Preston. Although that sketch was drawn a couple of hundred years afterwards, it might have been in Cromwell's mind. With his map he could have spotted out exactly where the invader's troops were, and if he had produced the line of march of Hamilton he must have seen the whole thing. He also knew that the Duke of Hamilton and Monro were moving separately, and he also knew that Langdale did not get on very well with the Duke of Hamilton, and that he was also separate. It was quite likely that he would be able to catch them in detail. Cromwell had about 8,000 troops, while the Scots altogether numbered 23,000. On the information he had, Cromwell made up his mind to march over the hills and fight and beat the enemy. He knew perfectly well

NASEBY
14th June 1645

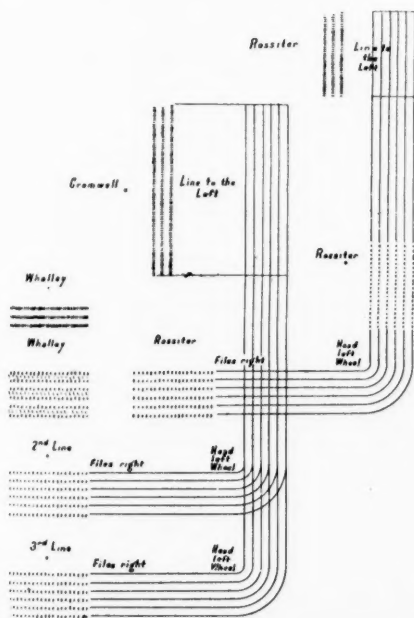
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Capt P. A. Charrier.

Nº 19 A.

DIAGRAM
showing Cromwell's Manoeuvre to the
attack of Sir M Langdale's Cavalry
at Naseby



The Cavalry fell in in 8 ranks on parade, one horse length distance between ranks and one horse length interval between files

All manoeuvring was done in this formation

When attacking, line was formed of three ranks by the simple process of Roman of the 2nd 4th & 6th ranks moving up on the left of their own files in the 1st 3rd & 5th ranks.

As far as possible an endeavour was made to have no intervals between squadrons in the attack. They rode in the closest lines to close order possible

NOTE

The diagram could not show all Cromwell's Cavalry, as it would take up too large a space

Whalley attacked straight to his front in two overlapping lines

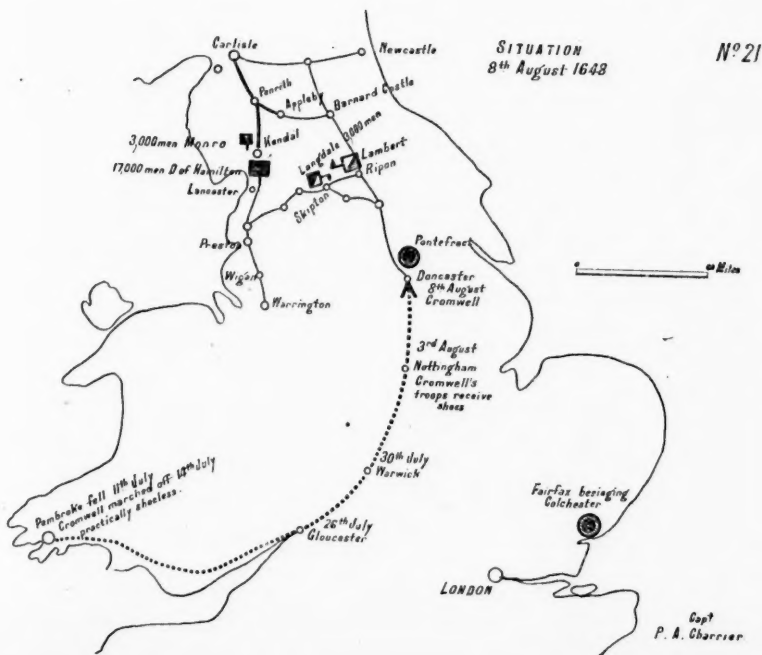
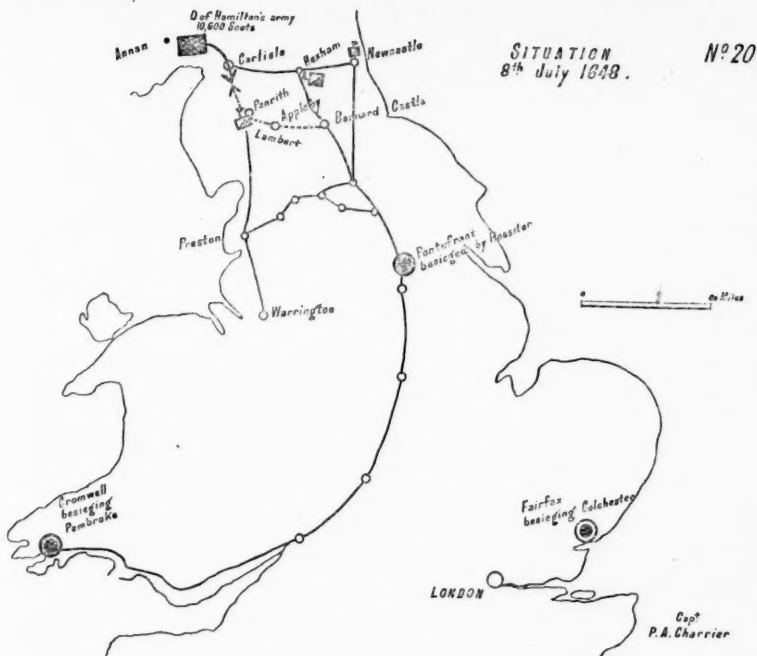
Capt P. A. Charrier

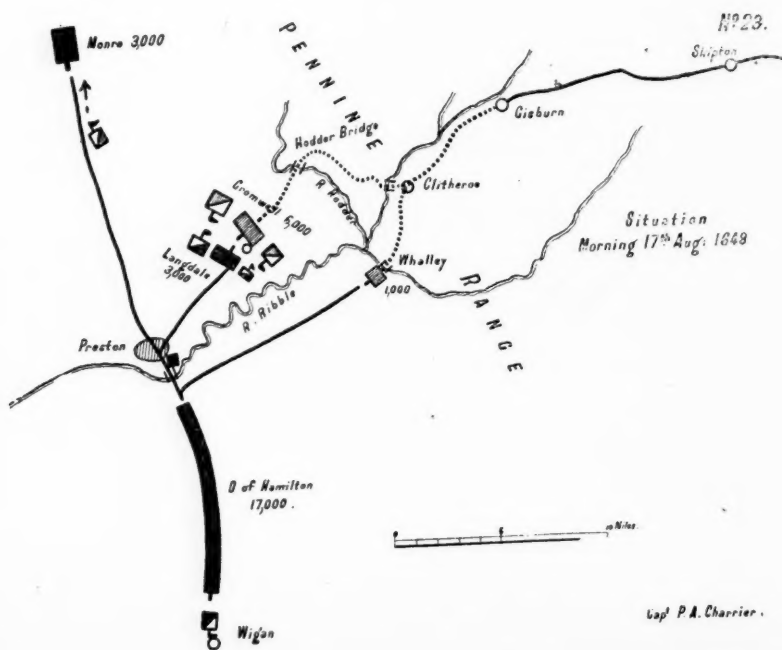
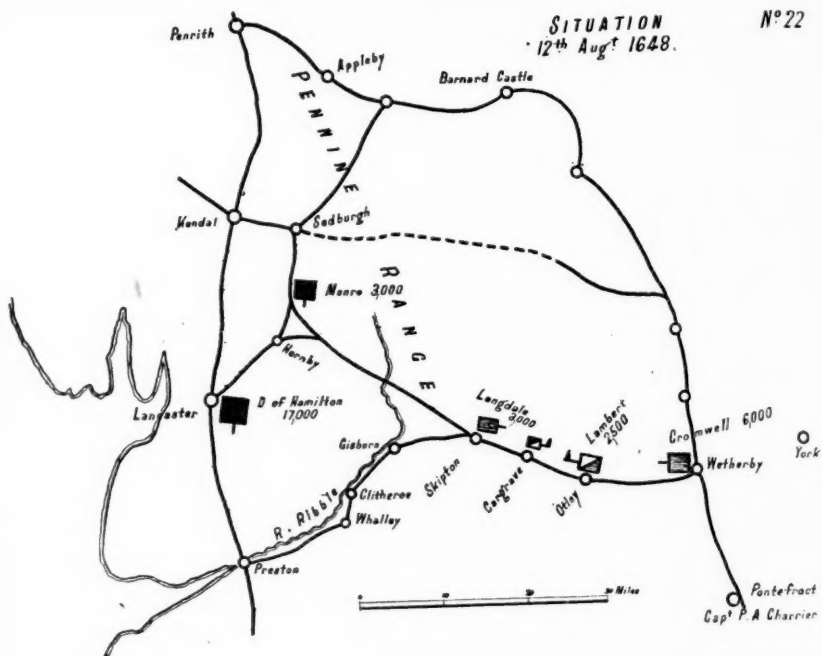
that in war you cannot win a victory by sleight of hand, but that you have to fight for it and take risks. He could not possibly afford to wait until more troops came from Colchester or anywhere else; and although he was only a third of the strength of the invaders he made up his mind to fight.

Plate 23 shows the situation on the morning of the 17th August, the day of the battle of Preston. Cromwell had crossed over at Hodder Bridge, and actually on that morning had 6,000 men opposed to Langdale's 3,000. Monro was a march up to the north, and the Duke of Hamilton's 17,000 were on the march between Preston and Wigan. So that on the morning of the 17th August Cromwell had fallen into the midst of all his enemies. He had seized a line like the Hodder and Ribble and had captured the bridges and put a thousand men at Whalley as a stop-gap in case the Duke of Hamilton marched back that way to Scotland. He had good information given to him by the cavalry, who for forty or fifty days had never lost contact night or day. During the course of that day Cromwell beat Langdale. Langdale sent for reinforcements from the Duke of Hamilton, but the Duke of Hamilton did not believe that Cromwell was really there, and he came back tardily. Of course he lost. I think he had to swim the river himself to get back to his own people. After the defeat of Langdale the Duke's army was so demoralised that they were merely a rabble. They retired towards Wigan, and we see Cromwell, without a minute's rest, pursuing them. The battle and pursuit was practically one continuous movement. He pushed his cavalry across the bridge the same night, went on all night, got into a fight near Wigan, and again near Warrington, and on the 19th August 10,000 of them surrendered to him at Warrington.

I think Cromwell knew how to carry on war, and it is an extraordinary thing that Cromwell is very much read in nearly every country of the world and not in ours. I know for a fact that he is studied in three war schools very deeply. We have the Inspector-General of Cavalry here, who will tell us some more about Cromwell. Cromwell realised that man was the principal weapon to be used in war—man and the horse. His men were disciplined; he was full of

NOTE.—The lecturer requests us to append the following statement from a lecture by Dr. Maguire at Woolwich some years ago, also presided over by Major-General Maurice, which proves that the British had been adepts at the art of war for nearly a generation before the battle of Marston Moor, and that thousands of Scotch and English had served in the "Thirty Years' War" under most distinguished generals, 1618-1648:—"Who were some of the very best troops fighting on the Continent of Europe in this Thirty Years' War?—Scotch and British soldiers. Leslie, who commanded at Dunbar against Cromwell, learned the art of war in the Rhine Land campaigns. As to the army of Gustavus Adolphus, some of the most eminent soldiers of that Swedish Prince were Scotchmen. At the battle of Lützen, where Gustavus Adolphus was killed, the reserve was commanded by Henderson, a Scotchman. In the Swedish army, then the best in Europe, there were no fewer than six British generals, thirty British colonels, and 51 British lieut.-colonels. So famous was the soldiery of Britain that they were eagerly welcomed in any army under the banner of which they volunteered to serve."





decision, of energy, of self-control, of perseverance, and of endurance; and although I cannot tell you where he got his knowledge of war from, I hope somebody in this room will be able to do so. My time is up, and I thank you very much for listening to me.

Major-General R. S. S. BADEN-POWELL, C.B., Inspector of Cavalry :—The lecturer has pointed out that Cromwell was a great exception to the chief leaders, because he had never really studied the art of war to the extent that other great leaders had done, and he was at a loss to say why he was a great success. Cromwell seemed to be an exception to the great rule that you must study if you are going to succeed in war. When reading the "Life of Cromwell," by Theodore Roosevelt, one cannot help being struck by the fact which he emphasises on every page, viz., that sound practical common-sense governed everything Cromwell did. I believe the secret lies there. He was not tied down by any rigid rules of red tape in strategy or tactics, for he had apparently not fully studied them. He applied his great common-sense to each occasion as the circumstances demanded. That is, I believe, why he succeeded. It is a great lesson for all of us: that when one had studied the subject of war in all its details, one should not be tied down by red tape, but should use one's common-sense and apply it to the occasion. The lecturer has brought forward many points which are of great interest and instruction to us, but there is one small one which ought not to escape the attention of students, namely, the success that attended Cromwell's method of rallying his troopers when they got dispersed. When things looked bad, as they did on one or two occasions, when some of his cavalry were defeated and the rest scattered, he never lost heart, and his men never lost heart; they knew they had to rally again and attack somewhere else. Very often the enemy were deceived by that, thinking that the Roundheads were scattered and broken up, and took no further notice of him until they suddenly found him attacking again from quite a new direction. That was the secret of his success on many occasions, and one that has its lesson to-day just as it had in those days—that when all seems pretty bad, and you are scattered and broken, keep up a good heart and get together again and have another go. So often young officers, when on small detached work, get tempted by temporary successes to go further afield, seeking more leaves for their laurels, and so they get out of hand. I have known it happen over and over again. Their first object, on completing their special job, should be to get back again and get in hand under the leader, because in that way the leader does not find his forces frittered away down to nothing, but finds them being continually augmented by detachments coming back to help him. That is one of the lessons that ought to be picked up from Cromwell. I should like to express my personal thanks to the lecturer for the way he has brought forward this subject, because it is of the greatest interest and greatest value to cavalry officers, that the doings of this great cavalry leader should be better known to them than in the past. We have neglected him too much in our studies in England, while, as the lecturer says, he has been very much studied abroad. I hope the fact that he has now been brought forward will induce a wider study of him in our branch of the service in England.

Major-General J. B. RICHARDSON, R.A. :—I merely wish to ask the lecturer where he gets his information of the battle of Winceby? I happen to live near Winceby, and have tried to pick up something about

the battle. The Parish Registers of Winceby give no information. There is the tomb in Horncastle Church, and the scythes with which the Royalists were mown down by the peasants, but there is no record of the exact place, and it is most difficult to trace.

Colonel T. S. BALDOCK, C.B., R.A. :—The lecturer has given us instances of Cromwell's great skill as a tactician and as a strategist, first in his battles at Winceby and Marston Moor; and secondly, his conduct of the campaign in 1648; but he has not, I think, touched on one of the principal claims Cromwell has, as a great soldier, and that is his extraordinary powers of organisation. When Cromwell first adopted the military career he found the armies all about him were professional armies; the men were adventurers for the most part, enlisting for the hope of plunder and pay. The troops raised by the King and by the Parliament in the first instance were men very much of the same stamp. They were, as Cromwell himself said, "tapsters, base fellows," decayed serving men, men who were attracted to the career of arms by what they could make out of it. Cromwell was not a professional soldier himself, and when he raised his men he went to the men of his own class—yeomen, farmers, and men who were well-to-do in civil life, and who had a stake in the country. They came to his banner, not in the hope of plunder or reward, but because they believed in the cause he represented. They fought for a cause, not for pay. In that I think he was the originator of the modern system of armies. The army of to-day, abroad at any rate, is not an army of mercenaries and paid men; it is the whole nation under arms. Cromwell's idea was to bring the whole of the better part of manhood in his Eastern Association under arms, to fight for a cause in which all that part of the country believed. His organisation had reacted on his strategy and tactics, and that is probably one of the reasons that he became such a prominent leader both in strategy and in tactics. If you think of it, the mercenary army of that day, both men and officers, lived by war. Their idea of war was to make war last. As long as the war was going on, their means of livelihood lasted, and when the war stopped, they were without employment, and joined the great army of the unemployed until they could get employment in some other force. The men of Cromwell fought for a cause, and wanted to finish a fight, and therefore in all Cromwell's campaigns he went straight to the point. It was not a question of manœuvres or a question of leaguers and sieges with him; it was a question of battles. His object was to defeat the enemy in the field, and I think perhaps he is the first of all who adopted what afterwards Napoleon was the great example of: when he found himself invading what was then the enemy's territory, he never allowed himself to be led astray in sitting down before fortified towns or taking up defensive positions until he had defeated his enemy in the field. He went straight for him, and his first object was to knock him out. He knew quite well that fortified places and positions would fall of their own accord. His innovation in that way, the individual line he struck out in disregarding the old laws of war as they had crystallised in those days, was one of the great reasons for his extraordinary success.

Colonel H. H. A. STEWART, late Donegal Artillery (Militia) :—If you refer to p. 11 of the book the lecturer has put into our hands you will find an observation which to me at all events appears a little cryptic. It is said in the last paragraph: "Infantry were drawn up some twelve to sixteen files deep of pikemen and musketeers alternately." That

paragraph the lecturer might give us an explanation of, because with files sixteen deep—thirty-two men—how could the thirty-second or the thirty-first or the thirtieth *rank* deliver their fire? All the men in front of them must kneel down. In those days, having delivered the fire, it took a minute or a minute and a-half to re-load. Nowadays, with a magazine rifle and seven or eight rounds in the magazine, you can fire off the seven or eight rounds while the cavalry squadron is approaching the front of the infantry. If you do a small sum in arithmetic you will see how many rounds they could let off at the approaching cavalry. The same paragraph in the book says: "The musketeers kept up a fire infinitely heavier than could be delivered nowadays along the same front."¹ I cannot for the life of me understand how thirty-two ranks deep could deliver as heavy a fire as could be delivered with a magazine breech-loading rifle.

Captain P. A. CHARRIER, in reply, said:—General Richardson asked for the authority on Winceby. All the information I have here, except of course some supplemental remarks, I have got out of Colonel Baldock's book, "*Cromwell as a Soldier*," in the Wolesley Series, that about Winceby particularly. Of course, from some other books, too, I have obtained information, but Winceby is taken chiefly from Colonel Baldock's very fine account. Colonel Stewart wanted to have that matter explained with regard to the firing. In the old days they were drawn up twelve to sixteen files deep. The first rank fired, cleared the front, and the next rank fired, cleared the front, and so there was a continual firing going on. Supposing a front was as long as this room, it would take about thirty men, and those thirty men would fire and immediately clear the front, and let the next thirty men fire, so that the firing was absolutely continuous. Nowadays along the same front you put perhaps four men with rifles in extended order. There is no doubt about it, that to charge infantry in those days when they were close together, keeping up a huge weight of ammunition, was no light task. Their bullets were very large, some of the guns used being the sort of thing that we used some years ago as elephant guns. Our bullet nowadays is a small pellet in a rifle, and the men are scattered about four or five or more paces apart. The amount of fire they had to face in those days was far greater than they have to face nowadays.

Colonel STEWART:—I cannot understand it in spite of your explanation.

Captain CHARRIER:—Then I am afraid I cannot give you any further information.

The CHAIRMAN (Major-General Sir J. F. Maurice, K.C.B., R.A., p.s.c.):—I am sure I may tender your very hearty thanks to the lecturer for his lecture. If he has done nothing else but provide us with all these different plates we should owe him a very great expression of gratitude. But personally my studies of the life of Cromwell have led me to a rather different conclusion from any that has been expressed to-day. It is quite true that we know very little indeed about Cromwell's

¹The lecturer is manifestly inaccurate in this statement. I have worked the problem out very carefully, and find that infantry nowadays could deliver a fire *at least eight times* heavier or more intense from the same front than the Cromwellian infantry could.—H.H.A.S.

earlier days, but every indication he gives in his letters to the House of Commons, and in his speeches, shows that he had most thoroughly studied, as far as he could get hold of it, the history of his time. Now it happens also that the wars going on, or only just coming to an end, were wars of a very remarkable man, Gustavus Adolphus, not a soldier to be sneezed at. What he had done had been done in command of the particular friends of Cromwell's own set of people, the very people who were certain to come to Cromwell the moment the wars they were engaged in came to an end. Therefore, I do not think the mere fact that we have not got the records justifies us in assuming that Cromwell had no means whatever of gaining any information as to the condition of arms in those days. My impression has always been that Cromwell did possess a particular faculty, which is the very condition of all conditions for the successful conduct of war, namely, the power of putting himself in the place of people from whom he was intending to learn, and also the power of putting himself in the place of his own soldiers and the people he was fighting with at the time; in other words, he had the great faculty of imagination, which is one of the greatest faculties necessary to a great leader in war. In that way he was able to read the statutes of war without turning them into bands and ligaments to fetter his own genius, using them rather to enlighten and inspire it. That is how I read it, and not that he had never learned anything of war. The lecturer himself necessarily conjectures that what Cromwell had done must have been studied by the people who came after him. I find Cromwell taking up at the beginning of his time the stage of war exactly in the condition it was left by Gustavus Adolphus, and carrying it forward, but certainly not ignoring the experience of the past. Also, I may venture to point out that in the House of Commons, long before the war began, there were conversations on the subject over and over again; they had all looked to Cromwell as the man who was going to lead them in the war, and that must have been because they knew he was studying it, and not because they believed he was neglecting it. I do not think we have any right to assume that because the records of those days are not in existence, Cromwell had not taken the trouble to get the best knowledge he could of war. Therefore, I do not admit the exception. I have only now to ask you to allow me to offer your unanimous thanks to the lecturer for what he has done for us to-day.

THE CHITRAL CAMPAIGN.

(WITH 7 PLANS.)

By Captain H. ROWAN-ROBINSON, R.G.A.

CAUSES OF THE WAR.

THE policy of the Government of India had been, previous to the war, to exercise control over the external relations of Chitral, mainly with the object of watching the northern passes which led towards Russian territory. Internal complications, however, affecting the safety of the British Agent, necessitated further intervention.

On the 1st January, 1895, Nizam-ul-Mulk, the reigning Mihtar, was assassinated by order of his half-brother Amir-ul-Mulk, who insolently demanded recognition from Lieutenant Gurdon, the Assistant British Agent. The latter referred the matter to the Government, and, at the same time, asked for reinforcements from Gilgit. These were promptly despatched, and arrived on the 1st February. With them came Surgeon-Major Robertson, the British Agent.

In the meantime, Amir-ul-Mulk, feeling the weakness of his position, had written to Umra Khan, the ruler of the neighbouring state of Jandol, asking for his assistance. This ambitious Pathan promptly advanced, crossed the Lowarai Pass, and captured the Fort of Kila Drosh. Dr. Robertson ordered him to withdraw, and even assisted the Chitralis against him, but without success. The arrival, in Umra Khan's camp, of Sher Afzul, Amir-ul-Mulk's uncle, who, two years before, had been Mihtar of Chitral, and had been driven from the country, further complicated the situation. The Chitralis, who had hitherto opposed the Pathan chieftain, now made common cause with him, for they preferred Sher Afzul as a ruler to his nephew. Dr. Robertson wrote to Sher Afzul suggesting a conference and intimating that the Government would probably be willing to recognise him as Mihtar. The only reply was an insolent demand for the withdrawal of the British troops to Gilgit; this demand was followed by a general advance of the combined Pathan and Chitrali forces. On the 3rd March a severe action took place at Chitral, in which the British were worsted and driven into the Fort. On receiving information of this disaster, the Government ordered the mobilisation of the 1st Division at Peshawur, and telegraphed to Colonel Kelly, commanding the Gilgit District, to make such movements or dispositions to assist the beleaguered garrison as might offer a reasonable prospect of success.

THE "EDWARDES" DISASTER.

Lieutenant Edwardes, with about seventy men, was on his way to Chitral from Mastuj, and on the 6th March had reached Reshun. The

temper of the inhabitants being uncertain, he decided to make a careful reconnaissance of the defile before advancing further, and sent Lieutenant Fowler ahead for this purpose. The latter found the hillsides swarming with Chitralis, and, after heavy fighting, fell back on Reshun. Here the detachment occupied a group of houses, which they defended with the utmost gallantry till the 15th March. On that day, under the pretence that peace had been made, the two British officers were treacherously decoyed out of their defences. The enemy then rushed the houses, and killed most of the garrison. Lieutenants Edwardes and Fowler were kept prisoners for a month, and then handed over to General Low.

THE "ROSS" DISASTER.

Captain Ross, with Lieutenant Jones and one hundred men, left Mastuj on the 7th March, with the object of assisting Lieutenant Edwardes. On the following day he entered the Koragh defile, without previously reconnoitring it, and found that the enemy had blocked the exit with sangars, which were too strong to be forced. He then fell back and endeavoured to withdraw out of the defile, but the Chitralis had come round to his rear and were now blocking the entrance also. He was thus forced to retire to some caves by the river, from which he made two ineffectual attempts to break out. On the 10th March he decided to get back at all costs to Koragh. The detachment started at 2 a.m., and succeeded in forcing a passage by storming the sangars at the entrance. Captain Ross was killed, and only Lieutenant Jones and fifteen men escaped. This small force fell back on Buni, where thirty-three men of the party had been left on the 7th. Here they remained till the 17th March, when they were relieved by Lieutenant Moberly from Mastuj.

THE DEFENCE OF CHITRAL.

The garrison consisted of six British officers, one hundred Sikhs, and three hundred Kashmir Rifles, under the command of Captain Townshend; the total strength, including followers, being five hundred and forty-three. The Sikhs were armed with Martini-Henris, and the Kashmiris with Sniders. The ammunition available amounted to about three hundred rounds per rifle.

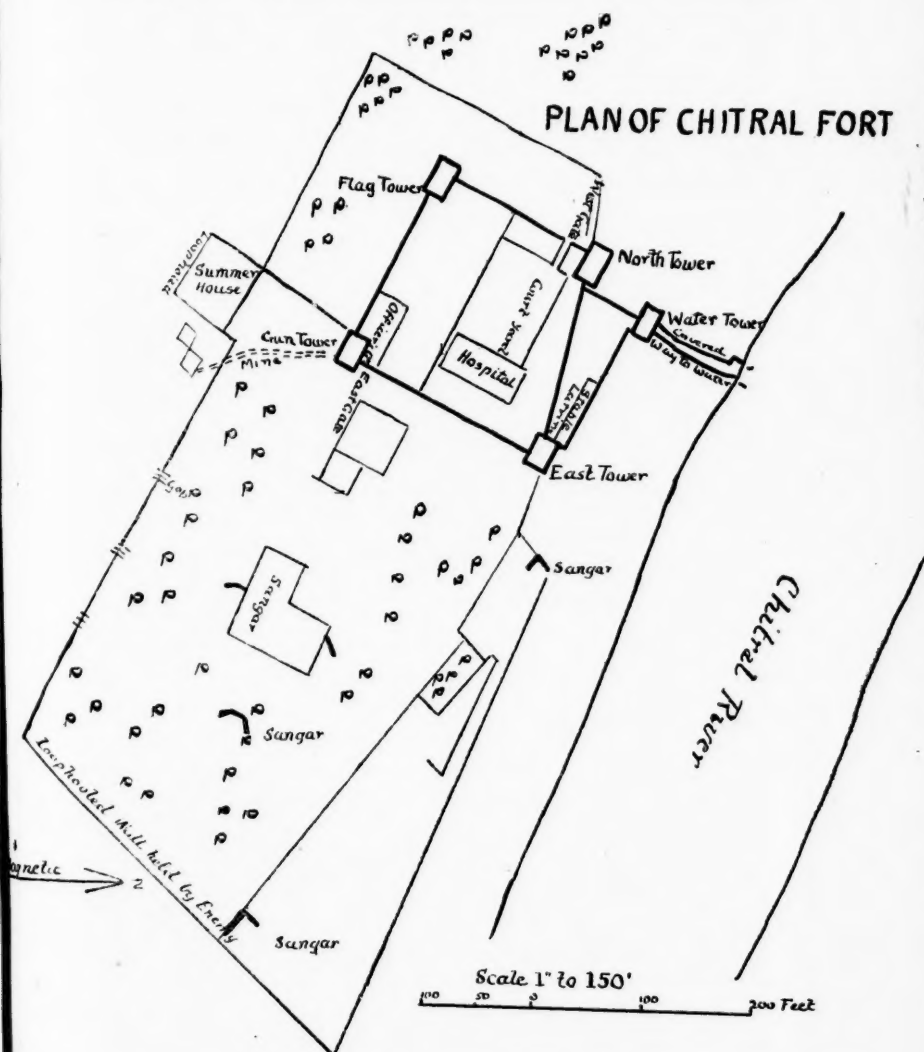
The Fort stands on low-lying ground on the right bank of the river. It is commanded, within rifle-range, on all sides, by hills, from which the interior of the fort is clearly visible. The south face has a good field of fire for about six hundred yards, but the view from the east and west faces is considerably obstructed by trees, gardens, and outbuildings. The walls are built of stone, supported by wood, and are easily set on fire.

GENERAL PRECAUTIONS TAKEN.

The garrison was put on half-rations. With this economy it was calculated that the supplies would last two and a half months. The whole of the first day of the siege was spent in destroying walls and outbuildings near the fort; and this work was continued whenever opportunity offered.

A covered way, well screened from view, was made to the river, and the walls flanking it loopholed so as to bring a strong fire to cover the parties going for water.

To guard against attempts to fire the walls, a special picquet was stationed in the Water Tower, the interior of the fort was constantly patrolled by men on fire-duty, bhists slept with mussucks full



by their sides, and buckets of water and bags of earth were placed wherever danger was most feared. To deal with attacks by night, platforms were built out from the walls and fires lighted on them, so that assailants could not approach unseen.

Cover from fire (more particularly head-cover) was provided, and the interior of the fort screened from view by sacking and canvas.

THE BESIEGERS.

The tribesmen built sangars on all the surrounding hills, and occupied the village and principal buildings near the fort. Throughout the siege they continued, by means of skilfully-contrived covered approaches, to build sangars closer and closer to the fort, till eventually they had one within forty yards of the walls. They made several attempts to storm the fort by night, but the attack lacked sting; they went much nearer success when they tried to set fire to the towers, a method peculiar to local warfare, and one which taxed the resources of the garrison to the utmost.

THE SORTIE.

On the 16th April a constant beating of tom-toms was heard from a summer-house close to the gun tower. It was suspected that the object of this proceeding was to drown the noise of mining, so Lieutenant Harley and one hundred men were told off to capture the summer-house and destroy the mine. The enterprise was completely successful; the summer-house was captured and held by half the party, while the remainder exploded the mine; the party then returned. The casualties were heavy (twenty-one), but the moral effect on the defenders was excellent. To guard against any further attempts at mining, a subterranean passage was dug round the whole fort.

But the memorable siege was soon to end; on the 18th April the enemy withdrew from his positions, and on the 20th Colonel Kelly's relieving force marched in.

The siege had lasted forty-six days, and the defenders had lost thirty-nine killed and sixty-two wounded; there had also been a good deal of sickness due to bad sanitation.

GENERAL LOW'S ADVANCE.

On the 19th March the order was given for the mobilisation of the 1st Division (fifteen thousand men) at Nowshera. It consisted of three brigades of infantry, each of four battalions (two British and two Native), two regiments of cavalry, four mountain batteries, one pioneer regiment, and three companies of sappers and miners.

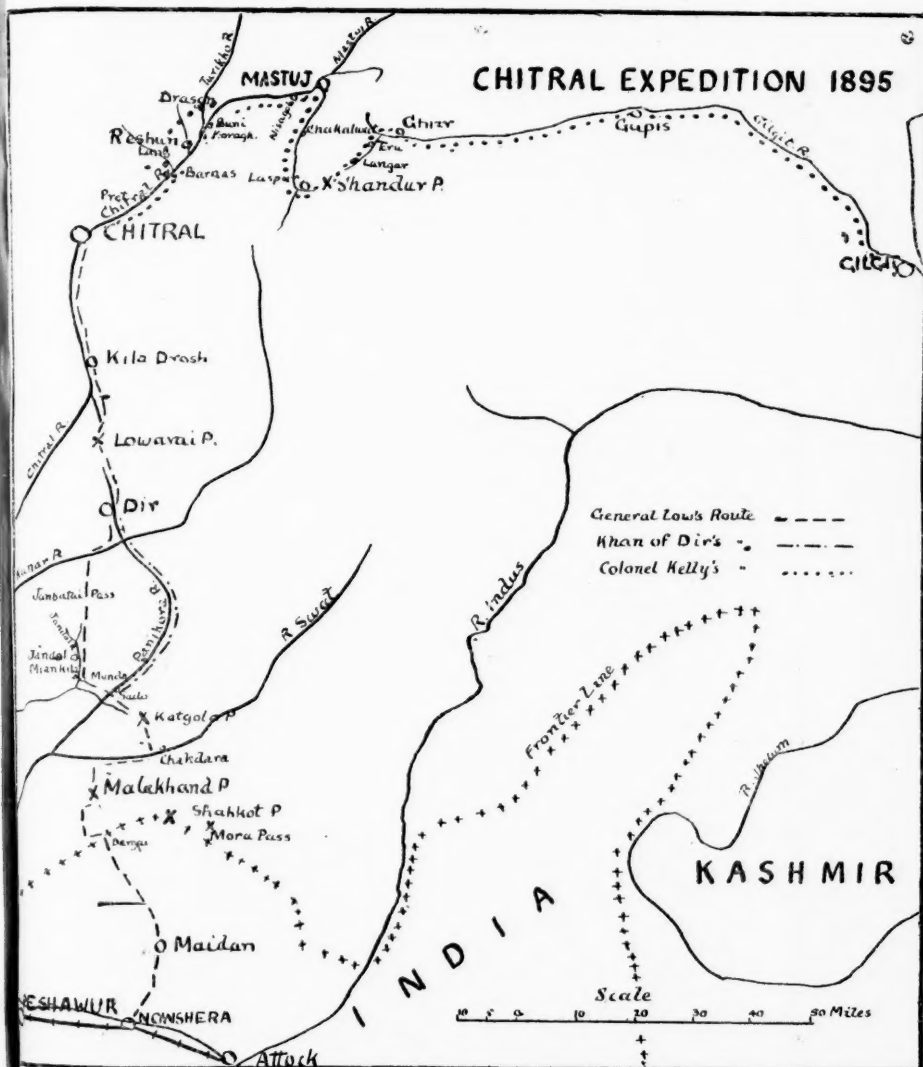
On the 1st April the Division moved forward. It was a race with time. According to report, the garrison of Chitral had supplies to last till the end of April. Two hundred miles through an unknown and difficult country had to be covered, four mountain ranges, and three large rivers to be crossed, and the opposition of some thirty thousand warlike tribesmen to be overcome—all in the space of thirty days.

Obviously, the first objective was Jandol—the State of Umra Khan; for General Low's approach would place that aspiring chieftain in a quandary. Either he would have to withdraw from the siege to defend his property, or he must yield territory in the hope of decisive success in Chitral.

Supplies for only twenty days were taken and no tents, yet twenty-eight thousand pack animals were required for transport.



On the 2nd April the Division was concentrated about Dargai at the foot of the frontier hills. This range is traversed by three main passes, the Malakand, the Shahkot and the Mora, all of which were



held. It was decided to force the Malakand, and to make demonstrations beforehand against the other two passes, in order to retain part of the hostile forces in them. These demonstrations were successful in effecting their object.

THE SWAT VALLEY.

On the 3rd April, General Low carried the Malakand Pass (Appendix A.). On the 4th the 1st Brigade pushed down into the Swat Valley, warding off an attack *en route* (Appendix B). On the 5th and 6th the valley was reconnoitred, and suitable fords found for crossing the Swat River. The Swatis, who had been reinforced by some of Umra Khan's troops, held some rocky heights on the north bank, with a good field of fire across and beyond the river. Brigadier-General Waterfield, who was in command, held the enemy frontally by long-range infantry and artillery fire, while the cavalry crossed by a ford higher up stream and turned his flank. The Swatis fled as soon as they saw the troopers, but the latter got in among them and killed about a hundred.

Three bridges (a suspension, a pontoon, and a trestle and pier) were thrown across the river, over which all three Brigades had passed by the 10th April. The 1st Brigade was left at Chakdara to guard the line of communications, and the remaining troops pushed over the Laram Range, *viâ* the Katgola Pass, to the Panjkora Valley.

THE PANJKORA VALLEY.

On the evening of the 12th a bridge of raft piers was completed, and the Guides infantry crossed over and intrenched themselves on the right bank. On the morning of the 13th the river rose and brought down great logs which carried away the bridge. The Guides were now isolated and in great danger, for it was impossible to build another raft bridge, and a suspension bridge would take at least two days to complete.

Colonel Battye, commanding the Guides, had, before crossing, received orders to burn some villages from which snipers had been annoying our working parties. Undisturbed by the peril of the situation, he effectively carried out this duty, but his force was savagely attacked in its retirement, and he himself was killed. (Appendix C.)

A suspension bridge of 100 feet span, constructed out of telegraph wire and beams of dismantled houses, was completed on the 16th April. Our ally, the Khan of Dir, with one thousand men, was now ordered to push ahead as rapidly as possible along the Panjkora River, and over the Lowarai Pass, into the Chitral Valley, in the hope that he would effect the speedy relief of the garrison, while the British troops, moving directly on Jandol, were to deal with Umra Khan's forces.

On the 17th a strong reconnaissance, under Brigadier-General Blood, was made towards Miankila up the Jandol Valley. The enemy was occupying this village and Munda in force, and streamed out to fight, but was easily and completely defeated. As information was received that the garrison of Chitral was in sore straits, the 3rd Brigade, on the 19th, was moved on alone, and crossed the Janbatai Pass. Next day, believing the situation still more critical, Brigadier-General Gatacre sent on a lightly-equipped force of five hundred men. The Khan of Dir, however, who had reached Kila Drosh, now sent word that the fort had been relieved, so the march was continued by easy stages. A portion only of the 3rd Brigade was pushed as far as Chitral.

COLONEL KELLY'S MARCH.

The force on the frontier about Gilgit, early in March, consisted of about one thousand infantry of the Indian Army, and two thousand

Kashmiris. As many of the surrounding tribes had only recently been subdued, it was thought inadvisable to send a large force to Chitral. The relief column therefore, under Colonel Kelly, which started in two detachments on the 23rd and 24th of March, consisted only of four hundred of the 32nd Pioneers, with two guns of the Kashmir Battery; later, it was reinforced by one hundred Hanza Nagar levies and forty Kashmir Sappers and Miners, and, after the relief of Mastuj, by the garrison of that place. No tents were taken, each man was allowed fifteen pounds of baggage, and seventeen days' supplies were carried.

On the 30th and 31st March the column arrived at Ghizr, and on the following day marched eight miles towards the Shandur Pass. But there had been a heavy snowstorm, and, as it was found impossible to get the battery mules and transport along, the force halted at Teru. Snow continued to fall, so the force remained at Teru and Ghizr till the 3rd April. On that day Captain Borradaile, with some three hundred men and two guns, succeeded in reaching Langar, a point nearly 12,000 feet high. The men had been carrying the guns, but under tremendous difficulties. It was, therefore, decided to leave them at Langar under an escort. On the 4th, Borradaile reached Laspur, and from there sent back villagers to help the guns over the pass. On the 5th and 6th, Colonel Kelly, with the remainder of the first detachment, arrived. Hearing that the enemy were gathering in force about Chakalwat, and fearing that any delay in attacking them would result in an increase to their forces, Colonel Kelly decided not to wait for the 2nd detachment, which was not expected at Laspur till the 9th, but to proceed to Gasht.

On the 8th a reconnaissance found the enemy, strength about five hundred, in a position of great natural strength. On the 9th April this position was carried (Appendix D.) and, continuing the march, the force reached Mastuj, relieving the town, which had been besieged for eighteen days. Here Colonel Kelly remained on the 10th, 11th, and 12th. On the 13th, he moved forward with three hundred and eighty men, and carried the Nisa Gol position. (Appendix E.) He now determined to avoid the dangerous defiles about Koragh, which had been so fatal to the parties of Ross and Edwardes, and which were still held by the Chitralis. He therefore made a wide detour, *via* Drasan and Lun, crossing the Chitral at a most dangerous ford near Barnas. By this movement he turned the last defensible barriers to his objective.

It is worthy of note that on the 17th April, when Colonel Kelly was within three marches of Chitral, Lieutenant Harley was making his brilliant sortie, and General Blood dealing the last blow to Umra Khan's forces near Miankila.

The relieving force encountered no further opposition, and entered Chitral on the 20th April. It had indeed performed wonders. For a party of five hundred men to march over three hundred miles in thirty days, through most difficult and mountainous country, to cross a pass 12,500 feet high, by a path 3 feet to 5 feet deep in soft snow, to ford deep and dangerous rivers, to fight two successful actions, and ultimately to achieve its objective, and this not with mountain troops, but with men from the burning plains of India, is an achievement that ranks high in the annals of war.

STRATEGICAL LESSONS.

The value of entering a country with two widely separate forces is here exemplified. It is more than possible that the Peshawur force would have been too late to raise the siege of Chitral. On the other hand, had it not been for General Low's force, Umra Khan could have concentrated on the small Gilgit detachment and destroyed it. The general effect of the double invasion on the Pathan Chieftain was to render him uncertain and irresolute in his movements, and to make him so divide his forces as to be weak at all points. To have had any chance of temporary success he should have abandoned his state of Jandol and destroyed Colonel Kelly's force. He might then have captured Chitral, and with the prestige gained by these feats, have brought many followers to his standard, and have prolonged the war considerably.

Both relief forces had a definite objective and a strong incentive to push forward their operations with the speed and decision that is so bewildering to an Asiatic.

In small wars it is generally advisable to bring an enemy to book as often as possible, and to persuade him to stand. Colonel Kelly's march offers a notable exception to this rule. Not only was it a race against time, but men could ill be spared from his small force to make costly frontal attacks. Thus we find him turning the hostile flanks, tactically at Chakalwat and Nisa Gol, and strategically by his march *viâ* Drasan and Pret.

TACTICAL LESSONS.

Notwithstanding the difficult nature of the country, the cavalry rendered signal service during the campaign, more especially in the two actions at the Swat River and in reconnaissances beyond the Panjkora. They inspired the mountaineers with a terror equal to that with which Pizarro's Spaniards inspired the Incas.

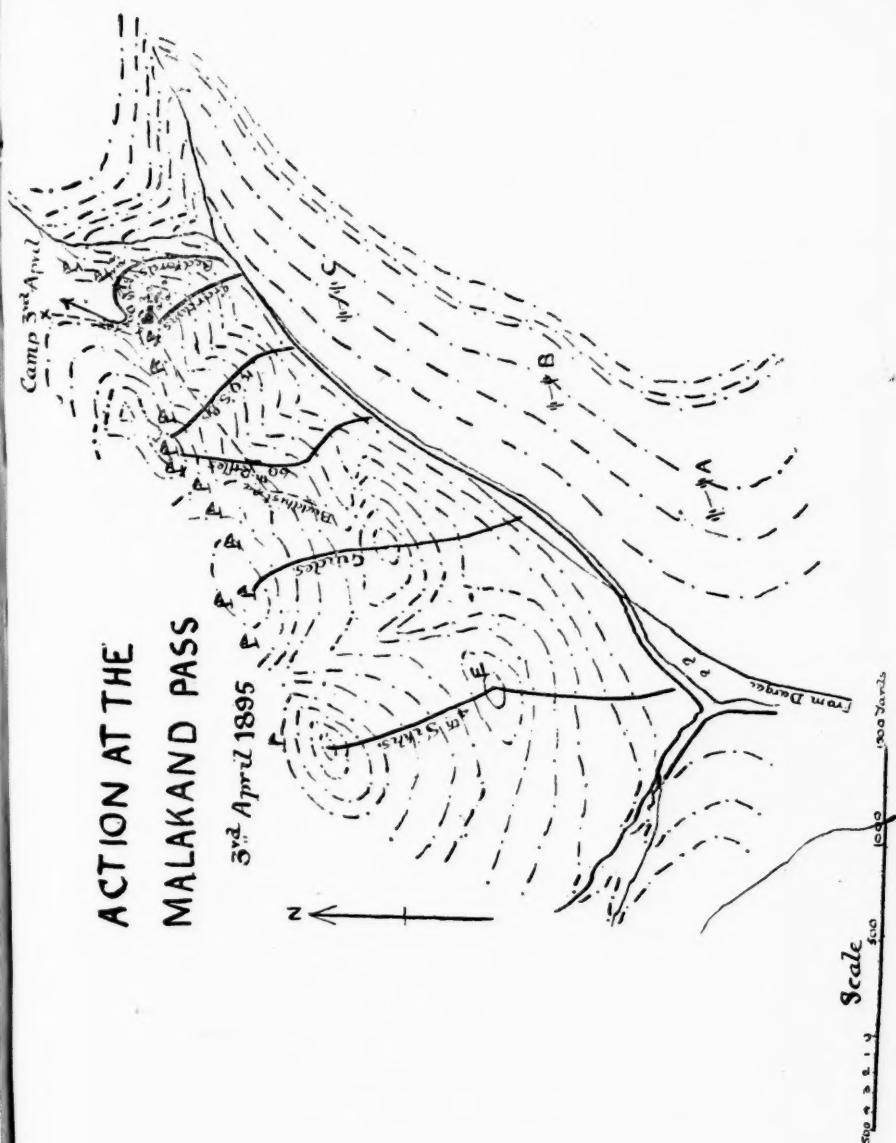
The artillery played a most important part with both relief forces, and generally followed their normal rôle, except that at Chakalwat and Nisa Gol the guns were pushed up to a range of less than three hundred yards from the sangars. The absence of guns in the Fort of Chitral was an enormous handicap to the defenders, for the Asiatic has an exaggerated respect for these weapons. Lieutenant Harley's brilliant sortie of the 17th April was a fine example of the offensive, which should always be combined with the defence of any position. It raised the *morale* of the defenders and created a corresponding depression in the minds of the besiegers.

APPENDIX A.

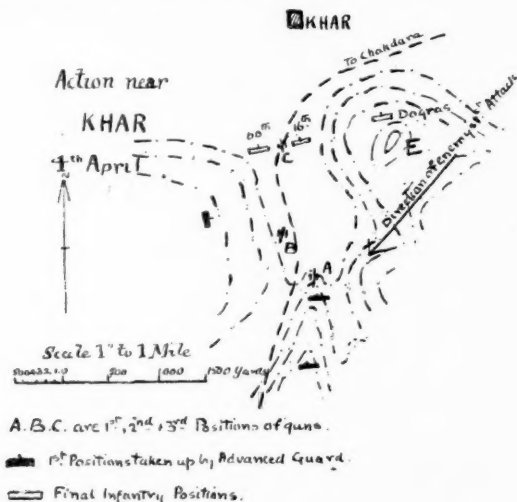
THE ACTION AT THE MALAKAND PASS.

It was first intended to force the pass with the 2nd Brigade, assisted by three mountain batteries, but the Swatis developed so strong a resistance that battalion after battalion of the 1st Brigade also was sent into action till eventually General Low had only the 15th Sikhs in reserve.

The enemy's line extended for about one and a half miles along the heights to the west of the Pass; their main position was about the village D., overlooking the Pass.



The 4th Sikhs were sent up the hill E. to cover the advance by rifle fire, and later, to follow the Guides, who were to ascend the steep mountain side and turn the enemy's right flank. The original intention had been to await the result of this movement before delivering the frontal attack, but the Guides took two hours longer in the ascent than was expected, so the other battalions were sent forward into battle in the directions shown on the map. The three mountain batteries supported the attack from the eastern slopes, and shelled sangar after sangar just ahead of the assailants as they pressed on. The successive positions taken up by them are shown on the map at A. B. C. The enemy fought obstinately, but was eventually driven everywhere from the field. The pursuit was carried out by the Bedfords and the 37th Dogras as far as the village of Khar in the Swat Valley. The action opened at 8 a.m. and the position was carried at 2 p.m. The enemy numbered about twelve thousand, but only about four thousand had firearms. During the attack the 60th Rifles hit off an old Buddhist road over the Pass, which was made fit for transport within twenty-four hours. Had it not been for this fortunate find it would have taken at least three days to make the other path practicable for animal transport.

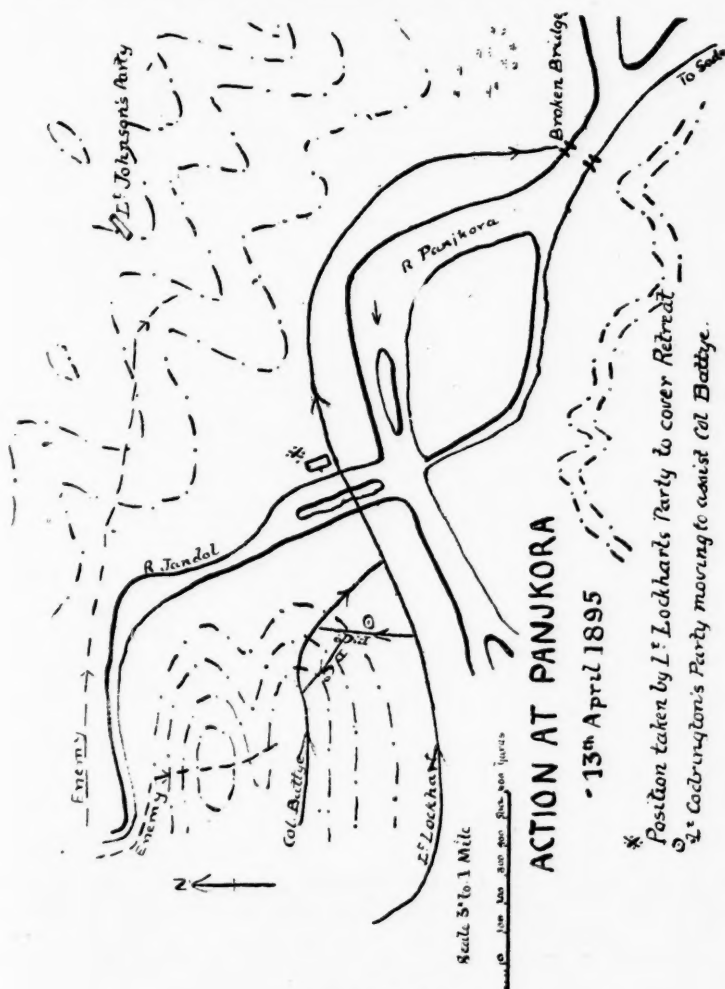


APPENDIX B.

THE ACTION NEAR KHAR.

On the 4th April the 1st Brigade was marching down the northern side of the Malakand Pass into the Swat Valley, when it was attacked from the east by about four thousand Swatis from the Mora and Shahkot Passes. Steps were at once taken to secure the exit of the defile, and to occupy the heights on either flank. The safe passage of the transport was thus secured, but the enemy, regarding the defensive attitude of the Brigade as a sign of weakness, boldly swept round the base of the hill E., to attack the column in front and flank as it debouched. The 37th Dogras were holding this hill and were

being hard-pressed, when two troops of cavalry moved round the spur, and, though the going was heavy, and the ground intersected with nullahs, charged straight into about twelve hundred of the enemy and drove them helter-skelter back into the hills.



APPENDIX C.

THE ACTION AT PANJKORA.

After burning the villages as described above, the main body of the Guides, under Colonel Battye, fell back, moving with the utmost deliberation in order to cover the retreat of the detached parties under Lieutenants Codrington and Lockhart further south. The enemy

†

ENEMY POSTED ABOVE
READY TO ROLL DOWN ROCKS

ENEMY IN SUNDARS
on his spur.

MASTU behind this
slope ↓

3745
Saddo 75

SHALE - SLOPES

PATH FROM LASPUB

ACTION AT CHAKALWAT

9th April 1895.

meanwhile, pushing rapidly over an intervening spur, crowned the heights above and pressed vigorously. Lieutenant Lockhart's party, which arrived first at the foot of the slopes, took up a position as shown on the map, to cover the main body, while the artillery (and later the infantry), on the left bank of the Panjkora, rendered effective assistance by their fire. To deal with the left hostile column, which was endeavouring to cut off Colonel Battye's retreat, Lieutenant Johnson moved out with two Companies of the Guides which had been left in camp, and took up a position on some hills on the left bank of the Jandol. The retirement was conducted by alternate sections and in perfect order; the enemy made several attempts to charge home, but was checked by steady volley firing. When the entrenched camp was reached, every preparation was made to repel a night attack. A company of Sikhs and two Maxims were sent across the river to support the Guides. An attack was projected, but never took place, and this was due, it is believed, to the disconcerting effect of star shell, which were fired at intervals by the battery on the far bank.

APPENDIX D.

THE ACTION AT CHAKALWAT.

Lieutenant Beynon, with the Hunza levies, ascended the high hills on the left bank of the river, in order to turn the enemy's right flank, and the Puniali levies those on the right, to expel the enemy from above the stone shoots. The rest of the force formed for attack on the ridge as shown on the map. The enemy was driven from Sangars A. and B. by rifle and shell fire at eight hundred yards, and from the Sangars on the hill side by Beynon's levies. A general advance was then made across the river, Sangars A. and B. occupied, and the enemy driven from the remainder.

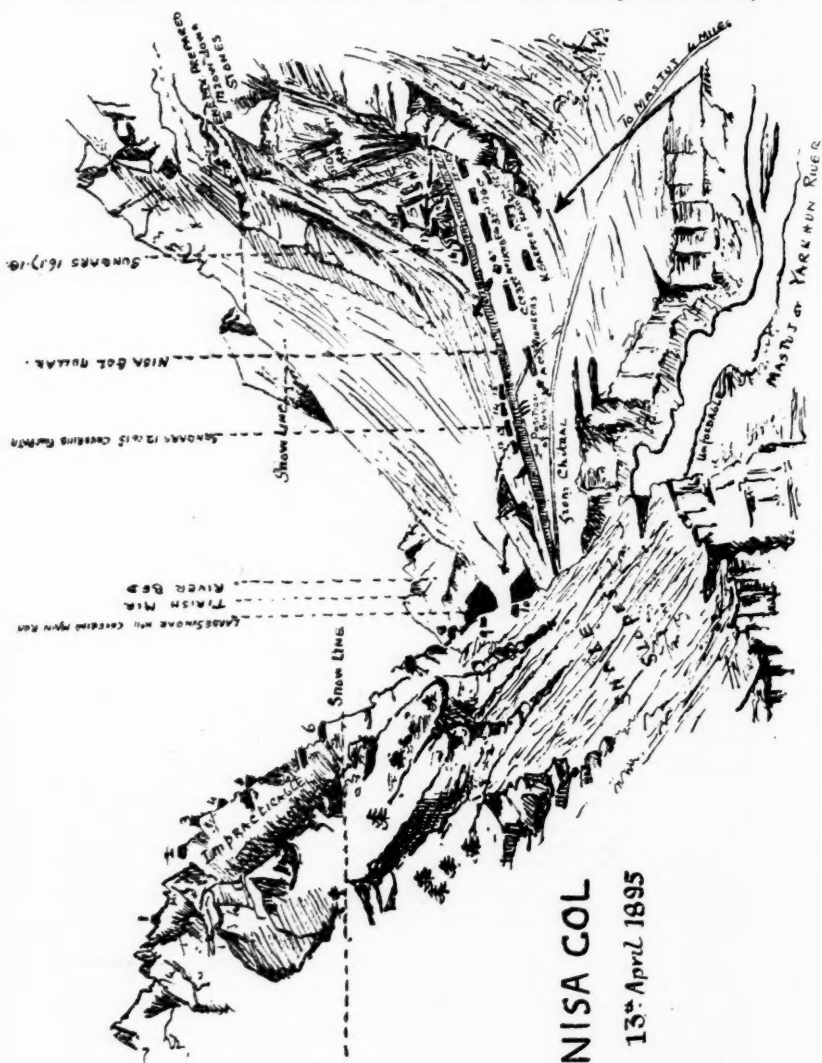
APPENDIX E.

THE ACTION AT NISA GOL.

This position was occupied by about fifteen hundred Chitralis, and was of great natural strength. The main valley here is about a thousand feet wide, and bounded by hills several thousand feet above the river, which is some two hundred yards wide with precipitous banks. At right angles to the river runs the Nisa Gol ravine, two hundred to three hundred feet deep, across which there are two passages, C. and D., the former a mere goat track, which had been obliterated on the Mastuj side. The enemy had Sangars commanding both these approaches, and also on the hills on either side, in the same line. High up on his left were parties of men detailed to hurl down stones.

The infantry deployed in front of the left and centre of the position, and, aided by the guns, silenced the Sangars in succession, beginning with No. 17. Meanwhile, it was reported that a practicable place for crossing the "gol" had been found, so the Sappers, provided with scaling ladders, were sent forward to make a path there. Within half an hour this work was sufficiently advanced to allow of the passage of a party of fifteen men, who, covered by fire from the infantry, managed to climb down and up the steep sides of the nullah. Just at this moment, the levies, running the gauntlet of the stone

shoots, reached No. 17 Sangar and turned the position. The enemy then beat a hasty retreat along the whole line, coming well under the fire of the deployed infantry in doing so. The tactics adopted resembled those so successful at Chakalwat. The artillery and infantry



deployed in the open, brought a heavy fire to bear on the Sangars, while the levies, ascending the high hills on the flanks, turned the position.

THE VON LÖBELL ANNUAL REPORTS ON THE
CHANGES AND PROGRESS IN MILITARY
MATTERS IN 1905.

Précis from the German by LIEUT.-COLONEL E. GUNTER, *p.s.c.*,
(late) *East Lancashire Regiment.*

Continued from the October JOURNAL, p. 1261.

PART II.

REPORTS ON THE PROGRESS IN THE SEPARATE BRANCHES OF
MILITARY ART.

INFANTRY AND COMBINED TACTICS, 1905.

A.—WAR EXPERIENCE, AND QUESTIONS OF GENERAL
INTEREST.

As regards the late war in Manchuria, it must be remembered that on neither side did the employment of the cavalry and artillery come up to modern requirements. Machine guns have become of great importance. Their use by the British as battalion guns has not answered expectations, whereas their employment in groups by both Russians and Japanese was successful. Fights for localities have again been predominant. Bogus-trenches, screens, and obstacles have much assisted entrenchments. Technical appliances, such as the field telegraph and telephone, have found use even on the field of battle. We hear nothing of motor cars, bicycles, or snowshoes, and the war balloons used did not come up to expectation. The question of infantry attack loomed large, but the war did not quite solve this problem. The experience of the South African war was confirmed, that without the protection of covering fire, infantry cannot advance beyond medium distance without annihilation; on the other hand, the fire-effect against skilfully concealed infantry is not worth the expenditure of ammunition. Losses are unavoidable if leaders wish to attain success, and though these reach terrible proportions at certain points of a battle-field, their relative percentage has actually lessened.

The Japanese infantry, trained after the German method, proved that infantry opens, carries through, and decides the fight. Imbued as they were with the knowledge that sacrifice alone can ensure victory, they showed their skill in reinforcing with but little loss. No close formations were seen, and by utilising concealed and covered approaches they brought these up unscathed in small sections at a time,

and so secured success. Their lines of skirmishers were made always more or less dense, according to the enemy's fire-power.

Their method of advance was regulated by this and by the ground. Many leaders preferred to advance on a wide front by long rushes. If this was impracticable, small groups or even individuals gained ground to the front by alternate creeping and rushing, and in the attack of strong intrenchments, shelter-pits were dug. This was, however, only done when, both parties being on an equality, the attack came to a standstill, and where it was necessary to hold ground under fire. This light cover was always improved by the supports as they came up. If attack by day proved too costly of life, night attack was resorted to. The Japanese attack was generally characterised by co-operation of artillery and infantry, careful and long preparation, the absence of all normal forms, and, once the command to assault given, it was recklessly carried out. The backbone of this attack was careful preparation and the right use of reserves. If the attack is not successful, fresh troops are poured in until victory is assured.

The Russian methods were quite different. Trained in Dragomorov's instructions for the combined battle-action of troops of all arms of 1901, and the infantry drill of 1900, the offensive was indoctrinated, but was based on shock tactics, and on the use of insufficient numbers after insufficient preparation by fire. The use of the bayonet would have been effectual had it been accompanied by a good grounding in the use of the rifle; but this was wanting. Volley firing alone was taught, because this method enabled the leaders of keep their troops in hand. It was not the individual training of the men, however, that lost the battles, but the leading. It is true nothing is so difficult as to pass from a defensive adopted at the beginning of a campaign to a vigorous offensive, and the use of reserves is always an interesting point. The Russian leaders looked on these as a guard against unforeseen misfortune, never as the powerful weapon of a commander to impose his will on the enemy. As in former campaigns, the higher leaders made complicated arrangements for successive lines of defence, broke up the regular formations, made numerous detachments, and hesitated to make the final strenuous effort that might have ensured victory.

The apparent length of time the battles lasted is peculiar, but not characteristic of modern tactics. It resulted from the extreme care the Japanese took with their preparations, and from the extreme patience with which the Russians waited till these were finished, without ever thinking themselves of taking the initiative, and from the fact that the very extended positions were not attacked simultaneously and in equal strength, but one after the other.

The writer then discusses at length the possibility of attack in the open. "A strong will to get at the enemy can overcome even the murderous effect of the defenders' fire." This was proved by the Germans in 1870, and by the Japanese in Manchuria. A formidable rifle fire must be carried steadily onward. The men must understand that heavy loss is unavoidable, that every man is not bound to crouch down on the ground directly losses are felt in the leading line. Forward to within effective range is still the solution of the problem. This will only be possible if our officers maintain the mastery over their men. But fire alone will not drive out a tough opponent; nothing short of a vigorous bayonet charge will effect this. The more the

defender knows that rising up to retire will be his ruin, the longer will he hold on. But our troops must be practised in the charge to give them confidence in it. And herein lies the moral counterpoise to all improvements in firearms. We therefore require better training in the use of the bayonet, which must go hand-in-hand with rifle practice and the use of the spade. The Boers used only the rifle and spade; the Russians were only trained to use the bayonet.

One result of the war was the issue of new musketry regulations by Austria, England, Germany, Switzerland, and the United States of America. Some experiences from the war against the Hottentots are given. These, the writer says, are first-class soldiers, who advance in extended order at wide intervals (up to 50 paces), and thoroughly understand the use of cover, making it extremely difficult to locate them. In retreat they disperse to reassemble again.

The use of mounted infantry in Colonial wars is, it said, necessitated, but not in European warfare, where machine-gun detachments can produce the same effect. Cyclist corps exist in England, and Switzerland has worked out a plan of defence with cyclists as frontier guards, supports of cavalry, flank guards, and for threatening the flanks. In France and Italy there are Regular cyclist companies. In France these (175 strong) are formed into battalions. General Langlois, in the *Revue bleue*, of the 19th August, is a strong advocate for their extended employment in preference to mounted infantry. Commandant Gérard proved their value in occupying advanced positions far quicker than cavalry could, and in raids against the hostile communications in rear.

B.—INFANTRY TACTICS IN INDIVIDUAL STATES.

Austria-Hungary.—The new infantry drill† met with general approval. The good training of the infantry in counter-attack when acting defensively is remarkable. The new musketry regulations are adapted to the two years' service men. The targets are smaller, and great importance is laid on quick preparation of men for war. Field firing is left to commanders, and a special feature is made of their rapidly adapting their formations to the immediate exigencies of the case. From experiments carried out it was found that the performance of one machine gun equalled that of 50 men at a given distance in a given time. The amount of rounds carried by each man in action is increased from 100 to 120. To make up for this a portion of his emergency rations is carried in the regimental transport, and his clothing is lighter, so he really carries less by about 3½ pounds. Infantry telegraph patrols are now attached to each infantry division. Each has 3 groups of these. Each group of 15 (6 telegraphists, 9 others) carries 24 kilos. (15 miles) of light wire, with complete telephone apparatus, flags and night lanterns, signalling appliances, etc.†† A comprehensive little work by Captain Knebel, on night attacks, has appeared, as well as Major-General Menarèlli Fitzgerald's "Infantry in Attack."

† See the JOURNAL for November, 1905, p. 1279.—E.G.

†† How invaluable would such have been could they have been used at Spion Kop.—E.G.

France.—The new infantry training^{††} was thoroughly tried during the year under Report. *La France Militaire*, of October, 1905, speaks well of it; *Streffleur*, 1906, Vol. I., and the *Militär Wochenblatt*, No. 140, also discuss it. In this there is too much of "according to circumstances," etc. A Drill Book should have decisive instructions. The authors do not seem able to make up their minds what to decidedly order and what to leave to discretion. It is written for highly intellectual leaders. The value of fire tactics is recognised; but certain parts seem to contradict one another: here overstating the value of cover and of independent action, there a tendency to shock-tactics, bringing about the decision by the assault of troops massed in reserve (*troupes d'assaut*).*

British and American military spectators at the French manœuvres in 1905 found fault with their close formations, with their want of attention to taking cover—especially to the exposure of the reserves in close order to artillery fire.

Germany.—Last year the individual attack made further progress. Large bodies were no longer extended to advance under fire. Men were practised in reaching a certain indicated distance by creeping forward individually the line of skirmishers being gradually thickened. If anticipated that they would have to remain long under fire they had to construct shelter pits, etc. At manœuvres there is no time to practice all the methods the troops are taught. To satisfy the higher leaders, however, one method must be indicated. This may have led the reporters to write about "thick lines of skirmishers everywhere," etc.

The Committee under the Presidency of General von Bock und Polak is still considering certain further changes in the *Exerzier reglement* (Infantry drill). Increased importance has been given to machine guns.

Lieut.-Colonel von Freytag-Loringhoven, in his book, "*Der Infanterie Angriff in den Neusten Kriegen*"[†] (Mittler, Berlin), proves that well-trained, well-led troops need not even now shun the attack on entrenched positions.

The new musketry regulations, 1905,^{††} were necessitated by the introduction of the new "S" ammunition^{†††} with its

^{††} The French Musketry Regulations lay stress on individual actions. Fire is important as the means by which troops get to the front. When a new Drill Book is published in France by authority, our practical friends, the Germans, at once cause it to be translated and practised by German troops to compare it with their own.—E.G.

* See the JOURNAL for November, 1905, p. 1280.—E.G.

[†] This is a valuable work, in which this well known writer briefly surveys the war experiences of recent years, and discusses cause and effect.—E.G.

^{††} These are well worth the attention of British infantry officers. Chapter VIII., para. 177 to 224, on *Gefechtsmässiges Schiessen*, is well thought out, and though rather long, might, as regards systematic arrangements, be carefully studied by the composers of the Chapter on "Field Practices" in our Own New Musketry Regulations. A copy is in the Library of the R.U.S. Institution.—E.G.

^{†††} *Spitze Geschoss*, so called from more pointed head of the bullet.—E.G.

flat trajectory. The targets have been made more real, preparatory fire has been introduced, fixed sight now 400 metres, short distance now extends to 800 metres, medium from 800 to 1,200 metres; range shooting to be only introductory to field firing, etc. Captain Bernatzky has written about "*Feuer Überlegenheit*" (superiority of fire); General Rohne has remarked thereon; Major Balck on "*Taktische Fragen*" (tactical questions); Baron v. d. Golz, and other contributors, on "*Militärische Zeitfragen*" (questions of the day), in Vol. 12 of the *Jahrbücher*, 1905.

Great Britain.—The experiments with double-companies in India and Aldershot are reported to have been successful. The publication of Combined Training, 1905, is noticed; such remarks as "The unwieldy assembly formation is discontinued," "The advanced guard is for the first time given an offensive character," etc., show that every alteration in our Drill, etc., Regulations is closely scrutinised. The attack, etc., in Infantry Drill, 1905, is given in detail, and the alteration in the length of pace noted.

"The employment of artillery is now," it says, "more clearly laid down. It is now permitted to form the machine guns into batteries. Their high carriages are, however, disadvantageous."

The new musketry instruction is said to be characterised by its freedom from qualifications and its liberal allowance of ammunition to captains of companies to train their men with. The new issues show that the British military authorities are not blind to the defects of the old training. The late Colonel Henderson's "*Science of War*" is very briefly mentioned.

Italy.—The new infantry drill is divided into two parts: formal drill and tactics. In the latter no distances, etc., are prescribed for battle formations, these being left to the judgment of the leaders, according to the object of the fight, the ground, the necessity of obtaining preponderance of fire, and at the same time to keep the troops in hand, etc.; but it must be remembered, they say, that the present weapons admit of wider extensions, etc. No distant, medium, and effective ranges are given. The regulations do not quite satisfy the requirements of instruction for modern war, says an Italian officer, in criticising them, but they contain much that is excellent which could be worked up into an excellent training manual, such as the Italian infantry had a right to expect.

Russia.—New training regulations for infantry in battle were issued even during the late war. Infantry may advance by rushes or by creeping in open ground. If the enemy's fire is weak, then rushes may be 70 metres long; if heavy, 25 metres. The attackers are then to entrench. The idea of a "chief fire position" is given up. The attackers are to get as near the enemy as possible and to keep up the firing until the assault with the bayonet.

Night attacks are much practised, as well as night defence, night marches, etc. Marches through woods by night are undertaken to practise all bodies in not losing the direction. Judging distance by eye up to 1,500 paces is practised; officers must be able to judge correctly up to 3,000 metres with the aid of the Sonchier range-finder.

Switzerland.—The Swiss infantry musketry regulations are in every respect up to modern requirements.

The leader proceeds tactically, according to the fire-effect of his companies, etc. It is calculated that the loss of one-third of his men brings his attack to a standstill until reinforced, or a similar loss by the enemy causes his advance to cease. Against cavalry the 300-metre standing sight only is used. One company of infantry at 1,000 yards can silence a battalion if it can score quickly enough; at 1,500 yards only under very favourable circumstances. Beyond this, two or more companies are required. Against shield-protected batteries more men are required, unless they can take the gunners by surprise in flank. At medium distances a zug ($\frac{1}{3}$ company, or about 40 rifles) is considered to put a machine gun out of action.

The "Infantry Training" Book of 1892 is being revised in accordance with these new musketry regulations.

C.—COMBINED TACTICS.

Austria-Hungary.—The manœuvres in the neighbourhood west of Botzen, which lasted from the 28th to the 30th August, 1905, with all modern appliances (new mountain machine guns, signalling, etc.), were very instructive. The Northerners had retired to Romeno (between Cleo and the Mendel), as their retreat was threatened. Their commander intended to attack with 21 battalions (having been reinforced by 3) the 13 battalions of the Southerners. The latter were commanded by the well-known tactician and writer, Lieut.-Field-Marshal v. Hötzenndorf. While he left 4 battalions in a strongly intrenched position to withstand the attack of the outflanking Northerners, he threw 9 battalions in attack formation into a wood and counter-attacked the latter with force and skill, aided by 4 battalions from his reserve. This compelled the retreat, with loss, of the Northerners.

Austrian military literature was prolific last year. Major Trisinger, an officer of the General Staff, treats of friction in war, "*Psychischer und Anderer Frictionen im Kriege* (Wien, Seidd), and urges practice in contretemps caused by this in peace manœuvres.

France.—Frequent practice in night operations is enjoined by the War Minister, as the late Russo-Japanese war shows that both sides made much use of these.

The various manœuvres held in France are detailed in the Report, which we cannot transcribe. It is considered that the constant attempts at surrounding the enemy led to too great an extension of the front. The cavalry often attempted to join energetically in the action of the other arms in a way that English and American officers agreed in condemning.

General Brugère often blamed the advanced guards for their conduct on meeting the enemy. Their duty is to secure the main body from coming under artillery fire while still in order of march or in close formation.

The advanced guard must, therefore, seize some tactical supporting points which will cover the deployment beyond artillery range. It then advances, strengthened if necessary, while the main body halts. It extends its infantry in loose formation, the line being gradually thickened, gaining ground gradually to the front from cover to cover. This is the only way nowadays without enormous loss, though it may

prolong the fighting. It will, however, take a long time to imbue the French Army with this method of fighting.

Great Britain.—*Field Service Regulations. Part I.*—*Combined Training* replaces the provisional issue. Part II. is to deal with administration, supply, etc. In these, advanced guards are for the first time permitted to use offensive action to gain information. The artillery are warned not to waste ammunition on unworthy objects; but the whole instruction hinges on the attack and defence of positions. Night operations and savage warfare are treated of at greater length.

The Report notices Sir John French's staff ride, with the general idea that hostile forces have landed both at Hull and Chester, and are marching on London, and his praise of the troops under his command for their skill in night operations, in entrenching, etc. The late Colonel Henderson's "*Science of War*" is mentioned as warning his readers against over-estimating the experiences of the Franco-German war, and the power of attack of modern cavalry; as is Sir Ian Hamilton's "*Staff Officers' Scrap Book*."

Italy.—Two army corps, the IXth and Xth, took part in the Corps Manœuvres from 25th to 31st August, 1905. These represented (in continuation of those of 1904) the operations of a hostile corps landing and the opposition offered to this. The Chief of the General Staff conducted them. A combined division of mobilised Militia was defeated at Benevento† by the invading Xth (Naples) Corps, but the IXth (Rome) Corps (defenders) sent the whole of their cavalry with their cyclist company to attack the invaders in rear, which led to the recapture of Caserta.†† Motors and radio-telegraphy§ were much used. The cavalry and infantry of the Line were much praised. The Militiamen were too old to withstand the hard marching, etc., necessitated by the manœuvres. Two heavy traction engines were successfully tried.

The Field Service Regulations are now being revised, and the following distances are prescribed for the marching exercises: For ordinary infantry in full marching order, at least 15½ miles daily for several days in succession; for Bersaglieri, 22 miles; the Alpini have to climb mountains for 10—12 hours daily; the cavalry have to march 35—41 miles; the H.A. and F.A., 28—32 miles.

CAVALRY TACTICS, 1905.

1.—GENERAL.

Cavalry are less used now for battle; more for intelligence. But the use of the *arme blanche* must not on that account be neglected in decisive battle or that of firearms in attacks against the enemy's flanks and rear. Cavalry divisions must still, therefore, be trained accordingly to act on horseback, and increased attention must be paid to dismounted action. It has become the custom in all States to attach machine guns to cavalry at manœuvres.

†About 38 miles N.E. of Naples.—E.G.

††20 miles N. of Naples.—E.G.

§The Marconi system has been finally adopted in Italy, and messenger (homing) pigeons are used by the advanced cavalry.—E.G.

This addition is an important factor in action against cavalry, and cavalry divisions can now with their aid assist in the decisive action of the other arms at any time. Our complete cavalry system, which assures thorough schooling of man and horse, is a guarantee that it will never degenerate into mounted infantry, and our officers taking part themselves in races, sports, hunting, etc., with their interest in and intelligence in progressively training and leading their men, is a further warranty of this.

A longer range rifle is, however, required.

More training than ever is required in strategical reconnaissance, etc.†

2.—CAVALRY IN INDIVIDUAL STATES.

Austria-Hungary††.—Out of 4 machine gun detachments which have been formed, 2 have been apportioned to the cavalry, each under a captain. Greater attention is being paid to dismounted action and to musketry instruction, which is the same as for the infantry.

The Austrian Automobile Club took part in exercises on the 15th October, 1905, having for object the trial of detachments sent forward in motors in support of the advanced cavalry.

An interesting exercise in the passage of rivers was carried out in September, 1905, at Duna-Földvár, on the Danube, below Buda-Pesth. Six Honvéd (Hussar) regiments, two brigades of horse artillery, eleven bridging companies of engineers, with fifteen sections of bridging train, four monitors, and a patrol boat of the Danube flotilla took part in these. Much technical experience was gained against storm and stream, and the cavalry, after crossing (partly in boats, partly by bridge), carried out strategical reconnaissance practice.

The great Imperial Manœuvres were held in Southern Bohemia, in the neighbourhood of Pisek, from the 2nd to the 7th September, 1905, in which 42 squadrons and machine gun detachments took part; 5 infantry divisions and 2 Landwehr divisions were exercised thereat.†††

France.—Cavalry Manœuvres were held under General Burnez in the Auxerre-Avallon-Tonnerre district; 5 regiments of the 7th Cavalry Division, 3 of the 8th, and 4 of the 6th took part. The *échelon* tactics were especially practised.

Army Manœuvres took place around Brienne in the East, under General Brugère, from the 7th to the 11th September, 1905. The 3rd, 4th, 5th, and 6th Cavalry Divisions took part in these. In the West, General Duchesne conducted the manœuvres N.W. of Poitiers. The 1st Cavalry Division attended, and was attached first to one side, then to the other. Machine gun detachments were used, the *matériel* being carried on pack horses.††††

†The Editor, Lieut.-General von Pelet-Narbonne, gave a lecture embodying his views on the cavalry future action, etc., in Berlin, which has been translated for the JOURNAL (January, 1906, p. 98, *et seq.*).—E.G.

††For organisation of Austrian and Hungarian Cavalry, see the JOURNAL, October, 1903, p. 1117.—E.G.

†††See *Militär-Wochenblatt*, Nos. 136, 137, and 138 (for Tyrol Manœuvres), where a full description is given. Some Regiments marched 40 kilometres (25 miles), and the Militia Division marched over 20 miles on several days' fighting after this.—E.G.

††††See *Militär-Wochenblatt*, Nos. 148 and 150, 1905.—E.G.

The new Veyry Cavalry Light Bridging equipment was tried.† It is considered in France that the advanced cavalry cannot now alone clear up the situation, so they are to be followed by Army Advanced Guards to pierce the screen, and to hold the enemy, to gain time for a better arrangement of their forces, and meet the hostile dispositions. This is a difficult and a thankless task, which military history seems scarcely to call for. General Bonnal wishes to avoid the cavalry duel. Certainly, with a weak cavalry this would scarcely help to clear up the situation. But too great circumspection is a greater fault in a cavalry leader than too audacious courage. We therefore cannot discern any progress in these views of the higher commanders in France.

Germany.—The cavalry were exercised in the following manœuvres, etc.:—

1. Rides.

- a. Under the immediate conduct of the Inspector-General of Cavalry, Cav.-General Edler v. d. Planitz, from 19th to 29th June, 1905, in East Prussia, and from the 3rd to 8th July in Lorraine.
 - b. Under the Cav.-General of the 3rd Cavalry Inspection from the 9th to 15th July, near Hameln.
 - c. The ordinary cavalry march, etc., exercises in nine army corps.
2. The manœuvres of the A, B, C, and D Cavalry Divisions in August and September.
 3. The exercises of a whole cavalry corps (2 cavalry divisions) in August, first against one another, then as a whole corps, commanded by H.M. the Emperor in person.
 4. The reconnaissance and screening exercises of the C and D Cavalry Divisions in the Province of Posen and in E. and W. Prussia, under the Inspector-General of Cavalry.

In the reconnaissance exercises (2 cavalry divisions, C and D, and 1 brigade of Leibhussaren), great attention was paid to field signalling. Each signalling detachment consisted of 8 troons with apparatus, and each cavalry division had two wireless-telegraphy stations with motors, etc., so experiments were carried out with cavalry signalling in a manner hitherto unattempted. It is too soon to pass conclusive judgment on these technical efforts. Speaking generally, it seems that in flat country with good roads motors are the best; in hilly country with bad roads the heliograph and lamps by night assert themselves. Wireless-telegraphy has evidently a great future before it. Messenger pigeons were also successfully used. The cavalry divisions were at first over 180 miles apart.

The Report then details the chief movements.

Six divisions sent their divisional cavalry regiments to take part in the Kaiser-Manöver, which the A and B Cavalry Divisions also attended. These manœuvres were held in Hesse-Darmstadt.†† The

†See *Militär-Wochenblatt*, No. 116, 1905; or *La France Militaire*, No. 6496.—E.G.

††A detailed account of these with criticisms by the Correspondent of the *Standard*, was published in the *JOURNAL* for February, 1906, p. 181.—E.G.

country was wooded and hilly, and unsuited for cavalry mass-action, but dismounted action was well exemplified in the defiles about Langenschwalbach.

Great Britain.—In England, cavalry are still handled as mounted infantry, even at Aldershot, under Generals French and Scobell. It was constantly the complaint that the British cavalry are far too weak. The new short rifle was said to be a success. The reconnaissance, and especially the condition of the horses, were unfavourably reported on by foreign observers at the manœuvres.

Russia.—No conclusions as regards the Russian cavalry as a whole can be arrived at from the performances of that employed in the late war. As far as can be judged, no real progress was made. Machine guns were attached to cavalry regiments; some of the new Rekl guns were used. Two or three troopers and one ammunition horse accompany each gun, which is carried on the trained firer's horse. With each 4,800 rounds are carried. The machine gun sections form part of the regiment, and it is intended that each section shall consist of 6 guns with ammunition horses.

FIELD ARTILLERY TACTICS.

General.—The Report enters into a long technical discussion of the results of shrapnel and common shell practice in the Russo-Japanese war, the merits of direct and indirect fire, etc., for which we have no space. The general conclusion seems to be that in order to hit, you must see and observe effect, and that for this losses cannot be avoided.

Austria-Hungary.—The new artillery organisation was tested at the manœuvres in Southern Bohemia. Each division had 1 field artillery regiment. The corps artillery consisted of 2 gun battery regiments and 1 howitzer regiment of 4 batteries. The corps was also well provided with field artillery.† An army corps will have altogether about 144 field guns and 18 howitzers at disposal in war. The howitzer batteries have in war 6 howitzers, 12 ammunition, 1 provision, 1 forage wagon, all 6-horsed; also 1 4-horsed baggage wagon, 4 2-horsed carts. The first line having the howitzers and 3 ammunition wagons; 2nd line, 6 ammunition wagons; 3rd line, 3 ammunition wagons, 1 4-horsed provision wagon, the baggage wagon being with the *grosse bagage*. The battery carries 504 shrapnel, 234 common shell. The mountain batteries proved thoroughly well equipped in the South Tyrol manœuvres. The new narrow-gauge guns and howitzers for mountain paths were not quite a success. It is thought, however, they were too highly tried.

France.—At the manœuvres the H.A. battery of 2 cavalry divisions were armed, as an experiment, with the 75-mm. Q.F. gun, apparently with success.

In retreats in hilly country it seems to be proved that the artillery must occupy high ground to the flank, whence they can hold back the enemy to enable the retreating infantry to take position in time to counter-attack the pursuing force.

†An Austrian Army Corps has usually 1 Field Artillery Brigade of 4 Regiments, of 4 Batteries—total 16 Field Batteries, besides Fortress (Garrison) Artillery Companies.—E.G.

In our last Report we were in doubt whether it was intended to form corps-artillery at all. It is now certain that in war, corps-artillery will be formed by grouping together batteries, etc., of divisional artillery.

Germany.—We regret that we can make no report of the progress made in the re-armament of the German artillery, which is of necessity kept secret.

French reports of the German field artillery tactics at the Kaiser Manœuvres criticise the indifferent use made of the ground and the exposure of the guns. The Austrian Strefleur reports attribute the massing of the guns to the restricted nature of the ground and to the excessive number of guns with the divisions. We think that it was more likely the result of our former regulations as to this.

Great Britain.—The Report notices the issue of Field Artillery Drill, 1906, and the non-issue of the new Q.F. guns it deals with to the home batteries.† It reproduces General French's remarks at the close of the short manœuvres as regards the field artillery.

Japan.—Since the last Report some details regarding the employment of the Japanese artillery in the late war with Russia have come to hand. Though the guns were skillfully dispersed to take advantage of cover, yet they understood well the art of concentrating the fire on certain objectives. As a rule the concentration and direction were carried on by regiments. At Liao-yang 180 field guns and 18 H.A. guns concentrated their fire on the Shaoshaupu Hill. The field telegraph was much used, by which in the earlier battles superiority of fire was attained. Cover for the guns was thrown up where required before daybreak, but the flash from the muzzles usually betrayed their position. They considered the moral effect of common shell good, though the material damage it did was considerable. Their cover was invisible and the emplacements well masked. All high exposed positions were tabooed. For instance, the saddles between hills were often chosen, where European officers would not have expected guns to be placed.

Russia.—In the late war with Japan, Russian reports†† notice the absence of the "artillery duel." The poor support afforded to the infantry by the field artillery in many instances is complained of. The possibility of uniting the fire of the batteries without placing these in one long line is remarked. The use of the telephone is necessitated, and observation is of increased importance. It is impossible to change position when once within a range of 3,500 metres of the enemy's guns. Moreover, in preparing the attack it is better not to move and so interrupt the continuity of the fire. It is better to bring up guns from the reserves to work against the enemy's flanks and to approach as close as practicable to his position. If the enemy gives way guns must be brought up at once into his position.

The distances must be measured and a rough sketch given to battery commanders showing landmarks, etc., before the preparatory fire actually begins. Cover is thrown up for the detachments only.

†The new Q.F. field guns and the new Heavy Art. guns have since been issued to the Aldershot Army Corps.—E.G.

††For more details see Military Notes in the JOURNAL for January, 1906, p. 126, from *Ruskii Invalid*.—E.G.

The wagons are kept within 500 metres of the guns in rear or to a flank. Ammunition must then be carried up by hand, as any movement of wagons, etc., would betray the position; 6 or even 4-gun batteries must replace those of 8 guns. The great requirements are good range-finders and telescopes, binoculars, etc. One infantry company should suffice as escort for each field battery; but they should be practised in serving the guns to replace casualties. This had been constantly practised by the Russians at their manœuvres.

The field mortars did not answer. Their effective range of 2,400 metres was insufficient, and the bursting charge of the shrapnel too weak.

Switzerland.—The field batteries of the Ist and IInd Army Corps were supplied with the new Q.F. field guns (barrel-recoiling, with shields)† in 1905, and those for the IIIrd and IVth Army Corps†† are being delivered in 1906.

The number of batteries is increased from 56 to 72, each having 4 guns, 10 ammunition wagons, 1 battery wagon, 1 field forge, and 2 supply wagons; 1,120 rounds are carried, and in the park 520 rounds per gun. Infantry ammunition columns and gun ammunition columns are kept separate. The corps park is in 2 sections, each having 1 infantry ammunition column and 2 artillery ammunition columns, each of the latter having 36 ammunition wagons.

FIELD ENGINEERING IN 1905.

The more detailed reports now to hand of the Russo-Japanese war corroborate the testimony as to the very important part played by field engineering in this great struggle. Entrenchments extinguished the hopes that were expressed that the formidable artillery of the present would rapidly bring about a decision, and at once pave the way for successful assault. At Liao-yang the Russians had prepared triple entrenchments: 1st, a bridgehead with a radius of $3\frac{1}{2}$ kilometres ($2\frac{1}{2}$ miles) of strong independent field works of strong profile, good depth, numerous well-flanked obstacles, field casemates under the front parapets, and large traverses running across the interior of the works. The spaces between these entrenched for infantry defence. Covered communications and artillery emplacements in rear. In short, an improvised fortified girdle of forts on a semicircle. 2nd, at about $1\frac{1}{2}$ kilometres (about nine-tenths of a mile) in front of this, infantry in position in shelter trenches. 3rd, on the hills which approached to within 10 kilometres ($6\frac{1}{4}$ miles) of the town a strong infantry and artillery position, extending to a length of 22 kilometres (about $18\frac{1}{2}$ miles). The Russians were able to hold this position until Kuroki's strategic surrounding threatened their line of retreat, on which Kuropatkin ordered their retirement.

The bridgehead then proved its value, for the attacks of two Japanese Divisions were successfully repulsed until the rear guard was ordered to withdraw.

† Details of this were given in the JOURNAL for October, 1904, p. 1150.—E.G.

††The Swiss Army Corps were detailed in the JOURNAL for October, 1903, p. 1128.—E.G.

The prepared advanced positions in front of Mukden demonstrated even more clearly the value of entrenchments. The Russian left successfully withstood Kawamura's advance on the Japanese right at Maechuntan. Kuroki was, it is true, able to penetrate a strong position on the Shaho; but coming upon the Russian second defensive line there he was repulsed, and even forced to evacuate the first line which he had captured. It was not till the 6th March that he was able, in conjunction with Kawamura, to force his way further on. The Putiloff Hills, the key of the position in the centre, were strongly fortified in the same way as at Liao-yang. Here Nodzu, with the 6th and 18th Japanese Divisions and two other independent brigades, could only succeed after bringing the whole of the heavy artillery, including the 28-cm. (11·1-inch) howitzers, to bear, which demolished the works, but these were quickly repaired again. On the 1st March the assault was commenced, but it was stopped by the fire from the redoubts after the trenches had been carried, and for two days and nights the assaulting columns had to endure this fire amid cold and hunger until the night of the 6th, when a redoubt was taken by assault, but only because the order for retreat had previously been given, because Nogi had now passed round the Russian right, and threatened to cut off their retreat.

General Oku, with the 2nd Army was also held up by the Russian entrenchments between the Shaho and the Hunho rivers. These examples suffice to show, without entering into details, for which we have not space, how the Russian field fortification succeeded in arresting the advance of the Japanese, and, exhausting them in costly effort, prevented their surrounding the Russian positions or following them up by vigorous pursuit when they retreated. In fact, both sides were so debilitated by the prolonged heavy fighting in the entrenchments as to be incapable of further immediate action.

That losses are much diminished by skilful use of the ground and of cover is evident from the fact that in the twelve days' fighting round Liao-yang the Russians only lost 516 officers and 15,974 men, *i.e.*, about 11 per cent., while in the twelve *hours*' fighting at Gravelotte the French lost 10 per cent.

The Japanese lost about 600 officers and 16,939 men, about 12½ per cent., which comparatively small loss is attributed to their method of advance. This was carried out in small isolated, independent groups in extended order; each advanced towards its objective without reference to its neighbours. As no firing was allowed during the advance, this was not dangerous. When halted, one man of a file fired, while the other dug him in with a small entrenching tool, which he used lying down. This was done by each alternately. The reinforcements utilised and improved these shelter-pits as they came up. At the attack on the bridgehead at Liao-yang shelter-pits were thus dug at 1,000 yards and farther on at 700 yards from the position, etc. The assault on the 2nd September failed, and the attackers recoiled 400 yards. These they again occupied (the shelter-pits thrown up during their advance), and the next day they repulsed the Russian counter-attack.

So in the attack. The Japanese 3rd Army brought their engineers to Mukden after their splendid training at the siege of Port Arthur. They were distributed among all the Japanese armies, and were always in the front line of the attack, throwing hand grenades,

destroying obstacles, etc. The Russians made equal use of these weapons. As the ground was rocky, the engineers made great use of sandbags. The necessity of a second defensive line, well strengthened, and of engineers to put any parts of captured entrenchments in a state of defence is well shown in the engagements.

2. Bridging.—The Japanese shewed themselves as superior to the Russians in military bridging as in other technical military sciences. The bridging train with each division consists of 6 officers, 345 men, 213 horses, and 170 carriages, with comprehensive bridging material. In order to cope with the hilly country and to enable one-horse carts to be used, half-pontoons were arranged for.* The Russians made no such careful arrangements, and as their bridging equipment was too heavy for Manchuria, they suffered. They had 5 companies with 450 metres of bridge; but these were constantly transferred from one corps to another, and with all this harassing work were insufficient for the purpose. There is no peace organisation of engineers with the divisions in Russia as yet.

In Austria this is being considered, in view of which light steel pontoons are being introduced, but the formation of independent division trains is not yet arranged. The cavalry bridging train has superseded the light bridging train hitherto projected, but the final choice between the Herbert system and that of de Vaux is not yet made.

3. Mining.—In one respect the Russians were, at all events at first, superior to the Japanese in sapping and mining. The latter had no text book on mining, their masters, the Germans, having neglected this branch, and they had to learn this neglected art under most difficult circumstances. We have neglected this and shall suffer for it as the Japanese did unless we again teach it to our engineer Jack-of-all-trades, even though the time available for each branch of their art is shortened and the training somewhat superficial.

The Russians were well schooled in the art of counter-mining, and their constant peace practice with land mines bore good fruit during the war.

4. Engineer Manœuvres.—The great siege manœuvres projected for 1905 round Thorn were abandoned owing to an outbreak of cholera. The Report describes briefly the manœuvres on the Rhine about Ganstein and those at Cologne in August. These belong rather to siege operations, and we have no space for them. Particular attention was laid to the "close attack" under modern conditions. General ideas, etc., were formulated, and the operations carried on with troops as in war.

5. Organisation.—The Report again goes to the question of the organisation of the engineers in the German Army. We have no room for the remarks of the author, which are much in the same sense as those epitomised in last year's Reports.†

* The *Kriegstechnische Zeitschrift*, Vol. 30, p. 335 gives details of these and their application.

† See the *JOURNAL* for December, 1905, p. 1041-3.—E.G.

NAVAL NOTES.

HOME.—The following are the principal appointments which have been made :—

Captains—D. R. De Chair to "Cochrane"; R. J. Prendergast to "Bacchante"; H. S. Grant to "Diana"; H. R. Robinson to "Africa"; H. Torlesse to "Aboukir"; F. A. Warden to "Russell"; W. O. Boothby, C. H. Umfreville to "Diadem"; H. C. Da Costa to "Niobe"; L. G. Tufnell to "Irresistible"; B. J. Yelverton to "Talbot."

Commander—A. G. Allgood to "Shearwater."

The old Royal yacht, "Royal George," long a familiar feature in Portsmouth Harbour, which dates from the time of George IV., and in which Her late Majesty made her first voyage to Scotland, is at last to be broken up. For many years she was used as the living hulk of the officers and men of the Royal Yacht "Victoria and Albert."

The "Dreadnought's" Trials.—The ship has now completed her first series of trials successfully. At the thirty hours' run at one-fifth power (4,600-H.P.), with the engines developing from 4,956 to 5,013-I.H.P., the ship maintained a speed of 13 knots, with a coal consumption of 2.6 lbs. per indicated horse power per hour. On the measured miles at seven-tenths power (16,250-H.P.), with the engines developing a mean of 17,698-H.P., mean revolutions of 297.9, the mean speed was 19.4 knots. At the thirty hours' trial at seven-tenths power, the engines developed 16,900-I.H.P., giving a speed of 19.3 knots, with a coal consumption of 1.7 lbs. per indicated horse power per hour, which compares very favourably with the results obtained from ships fitted with reciprocating engines. At the full-power trials several runs were made over the measured mile, and the trial was subsequently continued for eight hours. The engines developed a mean of 24,700-I.H.P., and measured at the shaft by a torsion meter, a speed of 21.6 knots was attained, with a coal consumption of 1.5 lbs. per indicated horse power per hour, a consumption which is said to be about 20 per cent. less than the average for corresponding trials for large war-ships during the last two years. The ship was very steady during the trials, and the engines appear to have worked very satisfactorily. The ship is fitted with eighteen Babcock and Wilcox boilers, each of twenty elements, arranged in three stokeholds, and fitted for burning oil fuel in conjunction with coal. The grate surface is 1,560 square feet, and the heating surface 55,400 square feet. Each of the cruising turbines has 39,600 blades in it, and the total number in all the turbines is in proportion.

The Yarrow Motor Torpedo-Boat.—The following interesting account of the new Yarrow motor torpedo-boat was given recently in the *Times* :—

"With the advent of the torpedo-boat propelled by internal combustion engines, and built by Messrs. Yarrow, a new departure in the system of naval defence, adapted for the protection of estuaries or harbours, appears to have been inaugurated. The original

idea of the torpedo-boat flotillas was, that they should consist of a great number of small units, each possessing high speed, exposing a small area to gun-fire, and costing comparatively little to build. In recent years, however, two of these essential principles have been departed from, and increased speed has been the object, necessitating larger boats, until the length of these craft, beginning at 75 feet, has gradually increased to over 150 feet. As the cost of each vessel has also been proportionately greater, it has followed that fewer boats have been built. It is doubtful whether this policy of fewer but larger craft has been the wiser, and whether the money might not have been better spent by a return to the former plan.

Messrs. Yarrow's motor torpedo-boat is 60 feet long by 9 feet beam, is provided with three propellers, and has a speed when loaded with three tons (an ample allowance for weight of torpedoes and fuel) of 24 knots, whilst a torpedo-boat driven by steam, and carrying the same load, would only attain to 18 knots. The radius of action of the former is 300 miles for one ton of fuel, and that of the latter 60 miles. An important feature of the Yarrow motor boat is that the petrol is carried in a special tank, and this tank does not form any part of the structure of the hull, so that in case of damage none of the petrol could find its way into the interior of the boat, thus avoiding a source of possible danger. The armament of such a torpedo-boat might be either one torpedo in a revolving tube or two in dropping gear at the side, and, moreover, she could carry one ton more armament than a steam-driven boat of similar capacity owing to the smaller amount of fuel she requires.

The little vessel has been subjected to exhaustive trials, the success of which have induced the Admiralty to purchase her; and, after delivery, further experiments will be made in order that the value for defensive purposes of a flotilla of such boats may be determined. In considering this subject, it should be observed that a craft of this size and weight—namely, eight tons—can be transported with facility by rail from one coast to another, so that a port undefended one day might be placed in a state of defence the next. In a run made from Cowes to Southampton and back, at 24 knot speed, the vibration was found to be exceptionally slight, although the engines were running over 1,000 revolutions a minute, their normal speed. It is suggested that the method of carrying out a system of defence with such craft would be to have special stations allotted to them, apart from a dockyard in the proximity of the mouth of any river or harbour to be defended, and it may be interesting to remark that 350 of these little vessels could be provided for the price of one "Dreadnought." It is understood that the firm is already directing its attention to the construction of larger and more habitable boats of the same kind intended to keep the sea for longer periods.

Mr. Yarrow, in referring to the purchase of the boat by the Admiralty, said that it was only one of the many instances showing how desirous the present Board are to avail themselves of any modern improvement to increase the efficiency of the Navy."

FRANCE.—*The Foundering of the Submarine "Lutin" at Bizerta.*—On the morning of the 16th ult., the "Lutin," one of the submarines stationed at Bizerta, and a sister-vessel to the "Farfadet," which foundered in that harbour about a year ago, left for submersion exercises, with a convoying vessel, with observers on board to watch the performance of the submarine, in attendance; the vessel appears to have made three dives successfully, but when a fourth descent was made, it was noted that instead

of the vessel reappearing in a horizontal position, she came to the surface considerably down by the stern, about 20 feet of the fore part appearing above the surface; and she then, after being above water for $1\frac{1}{2}$ to 2 minutes, slowly disappeared, and did not rise again. The behaviour of the vessel seemed to clearly indicate the entry of water into the after part of the vessel. Assistance was immediately rendered, but salvage operations could not immediately be undertaken, the sea being rather rough at the time, although the bottom was dragged and the position of the boat located. When the "Farfadet" was lost, she sank not far from the dockyard in only 30 feet of water, but the unfortunate "Lutin" went down in 110 feet of water. A telegram was sent to Malta asking for any assistance that could be rendered, and the battle-ship "Implacable," with the destroyer "Albatross" was immediately despatched by Admiral Lord C. Beresford to Bizerta, where they arrived early on the morning of the 18th, bringing with them certain diving stores and salvage appliances which had been requisitioned. Dragging operations were immediately resumed, assistance being also rendered by the Danish salvage steamer lying in the port. The position of the "Lutin" being definitely fixed, divers went down and found her lying on her midship section, but although they knocked on her hull several times, no reply was made.

The salvage operations were carried on for several days, great difficulty being experienced, owing to the depth of water in which she was lying, but the "Lutin" was finally got into the small floating dock which is stationed at Bizerta for the use of the torpedo-boats and submarines, and the work of pumping out the dock was completed by the evening of the 27th. When the dock was emptied it was found that the vessel had several leaks in her sides, one near the stern, one on a level with the water ballast tanks, one on the port side near the stern, and another near the after rudder. The rudder itself was bent, and the rudders were in position for an ascent to the surface. The hatch of the forward conning tower was found only half closed, and it is believed that an attempt was made to open the hatch, for the purposes of escape, after the bow of the vessel appeared above water, as soon as the crew realised that she was foundering; but the opening of the hatch could not be completed in time, and only resulted in admitting large quantities of water to the interior.

The "Lutin" class resemble in displacement and speed the "A" class of the British Navy, but they are 36 feet longer and 3 feet less beam. Their dimensions are as follows:—Length, 135 feet; beam, $9\frac{1}{2}$ feet, with a displacement of about 180 tons in the lightest condition, and about 200 tons when submerged; her speed was about 9 knots on the surface and 6 knots submerged.

The "Lutin" was commanded by Lieutenant Fépoux, and she had been in commission for some time, and she was manned by a crew of two officers and twelve men. A Court of Inquiry has been held, but their report has not yet been issued, but leakage aft appears undoubtedly to have been the primary cause of the disaster, and this raises questions as to the sufficiency of the structural strength of these vessels, when sunk to considerable depths.

M. Lockroy on the French Navy.—M. Lockroy, ex-Minister of Marine, has been contributing another interesting series of letters to the *Temps*:—

"For centuries France has occupied the second place among the maritime Powers of the world; she is now in a fair way of losing this

position for ever—this due to the great progress made by rival nations such as Germany, the United States, and even Japan. And what has already befallen the French mercantile marine may very well happen to the Navy. What, in this case, will be the fate of our Colonial Empire, purchased with so much blood and treasure? "No Colonies without a Navy" is an old maxim, the truth of which in these days should be obvious to everyone. Isolated from the mother country, the Colonies must fall (one after another) victims to the short-sightedness and incapacity of a Government which proved itself incapable of acquiring or preserving adequate supremacy at sea.

"The ambitions of our rivals are greatly assisted by the policy of the peace-at-any-price party who are working for the downfall of their country—a party, as evident lately by correspondence appearing in the *Temps*, which is interfering in the composition of our fleet, threatening the Minister with questions on the Naval Programme, and advocating the abolition of vessels of large size, and the construction of only torpedo-boats, to be built in the cheapest manner possible. It is not without a feeling of sorrow that one witnesses the meddling of people with naval questions, who, though otherwise eminent, have, as far as their knowledge of ships is concerned, seen nothing larger than the laundresses' boats moored alongside the quays of Paris.

"Because our torpedo-boats at Bizerta and Toulon have succeeded nominally in torpedoing some of the vessels of the Mediterranean Fleet, it is concluded, therefore, that all fighting ships of above 300 tons should be abolished. Had these people read the history of the Russo-Japanese war they would have known that torpedo-boats played but a small part in the actions on either side, that the Russian torpedo-boats in no wise hampered the operations of Togo before Port Arthur, and that if Japan had had no torpedo-boats, Rodjestvensky would not have succeeded any better in reaching Vladivostok.

"Without doubt, these small vessels, under certain circumstances, will render good service; they may be compared to the light cavalry of an army, but no one would think of confiding the guarding of our frontier along the Vosges entirely to light cavalry. We are obliged to have both cavalry, infantry, and artillery, and in the same way must have both small and large vessels, costing from 500,000 francs (£20,000) to 35,000,000 francs (£1,400,000).

"But the peace party may take heart; if we are not careful the force of circumstances will alone bring about our abasement.

"Leaving aside the United States and Japan, it is only necessary to consider the German shipbuilding programme, which is so conceived that if the French and German fleets are to-day about equal, in 1919, that is to say, in 13 years, our inferiority will be manifest. Little by little we have lost the superiority acquired by the patient work and patriotism of several centuries; in less than 20 years a Navy has been created by the side of ours which now threatens to surpass our fleet. We thought we were making great efforts in 1900; there was much talk of the augmenting of our naval strength—mere words, and nothing more. We were only replacing worn-out and useless ships; so much so, that the Budget for new constructions was not increased by a single centime. At the same time, the German Emperor was obtaining votes for considerable sums from the Reichstag for the increase of the German fleet. Later, again, under the Ministry of M. Pelletan, work in our arsenals, both private as well as Government, was restricted.

"Up to this time all previous Ministers of Marine had given orders for the annual laying down of from 35,000 to 40,000 tons of new vessels; this was now reduced to 16,000 tons—a little less than half. During the same period Germany added a new programme to the one already voted by the Reichstag, and raised the tonnage of her new constructions to 50,000 tons. Then the inevitable took place: France diminishing her new constructions and Germany increasing hers, brought about equality between the two rival Navies.

"The matter can be easily summed up. In the past four years (1902, 1903, 1904, and 1905) the French fleet has been increased by 17 new vessels, the German by 26; our 17 vessels represent 165,000 tons, the German 26, 195,000 tons. Among our 17 there are only 2 new battle-ships, the "Suffren" and "Iéna"; the 26 German ships include 11 recently constructed battle-ships, the "Elsass," "Hessen," "Preussen," "Schwaben," "Braunschweig," "Wittelsbach," "Wettin," "Mecklenburg," "Barbarossa," "Karl der Grosse," and "Lothringen." It is true that we have several armoured cruisers, but they are weakly armed, whereas the German ships have most powerful guns.

"The future is even more disquieting than the present. While the German programme fixes the number of battle-ships to be built by 1919 at 33, and the number of cruisers at 19, the French programme shows that at this date we shall only be able to put in line 34 battle-ships and 18 cruisers, or 4 battle-ships and 1 cruiser less than our neighbours beyond the Vosges. But we shall be lucky if we then find ourselves with only this number short. We have provided for the building of 11 new battle-ships in this period; therefore we are counting on 23 of the battle-ships we now possess being still fit for service—a matter about which there are grave doubts. According to Admiral Bienaimé, there really then will be only 8 fit for service, namely, the "Iéna," "Suffren," and 6 of the "Patrie" class. Admitting that Admiral Bienaimé is too pessimistic, and that we then may have 3 "Charlemagnes," 5 "Bouvets," (I say 3 and 5 for brevity, though they are not all the same), 1 "Brennus," and 1 "Henri IV."—though this is stretching the point to its utmost limit—we should then only have a total of 18 of the older classes (3 of which will be 25 years old in 1919), and not the 23 required. In the German fleet, on the contrary, the oldest battle-ship will then be 20 years old, and if the list of cruisers be examined the same results appear.

"Turning to the financial side, which is a guide as to efficiency, we find that Germany during the period will be devoting a mean annual expenditure of 168,000,000 francs (£6,720,000) to new constructions, while France will be spending a mean of 120,000,000 francs (£4,800,000), or at the most liberal estimate, 130,000,000 francs (£5,200,000); therefore we shall be spending on new constructions about 38,000,000 francs (£1,520,000) less per annum than our neighbours—equal to at least the cost of one battle-ship, which is the same as saying that in 13 years Germany will have 13 more battle-ships or the value of 13 more battle-ships than we have.

"If we do not want to accept this position and follow the lead of the peace party, we must without delay decide on the strictest economies and far-reaching administrative reforms."

Letter No. 2.—"Of all the Navies of Europe the French Navy is the most expensive. The cost of new construction in France is $\frac{1}{4}$ to $\frac{1}{2}$ higher than abroad, and accessory expenses for administration and supervision are also higher with us than in any other country. Our vessels are also longer building and longer getting through their trials than those of any other Power. The situation is a serious one; the attention of all

who interest themselves in naval questions has been drawn to it, the causes have been investigated and are various, but all authorities agree that the chief defect is one of organisation.

"Our ill success is due to the fact that in former days the organisation of our sailing fleet was almost too perfect; men of genius undertook this work, and above all the name of the grand Colbert stands pre-eminent. So perfectly did they organise everything, that to this day no one has the temerity to interfere with their work.

"Scientific men have in vain invented the steam engine, the application of electricity, the screw propeller, armour plating, ship building in steel, smokeless powder and quick-firing guns. The organisation which assured the power and was the glory of our sailing fleet exists to the present day as if nothing new had happened since the day of the "Roi-Soleil." Colbert and his successors, though no longer in this world, still regulate the affairs of our Navy, and for good or bad the modern Navy has been forced to submit. The result is a double charge on the Budget; the expenses of our sailing Navy have been religiously respected, and these have been grafted on those of a steam navy.

"For this condition of things must we blame the Navy itself or successive Governments and Parliaments? I think it would be unjust to do either; no one is blamable, and yet everyone is to blame. What has happened to the Navy has been taking place in all old-established industries. Due to the scientific revolution of our times, neither tools, machinery, nor workshops are now suitable for the changed order of things. Old traditions, however, die hard, and for long this hampering influence is felt. Newly started industries, on the contrary, are able from the day of their birth to avail themselves of all progress and discoveries that have been made, and it is here that both the German, Japanese, and United States Navies have the advantage.

"In a pamphlet which has made a considerable sensation, M. Ferrand, one of the most eminent of our naval constructors, has shown, in an irrefutable manner, how much the tradition of our wooden Navy paralyses activity. It is because our arsenals still go to work as in the days of Colbert that we do not get the return from them that we should. M. Ferrand arrives at these serious conclusions: 1st. That in war time our arsenals will be incapable of undertaking the repairs of the fleet; and 2. That in peace they are not in a position to construct new vessels under conditions acceptable from both the military and financial point of view. These are sad conclusions to come to, and no one is better able to judge the matter than M. Ferrand, who has passed his life in our arsenals. Moreover, the illustrious M. Bertin is of the same opinion. Who, then, is responsible for this situation? Our engineers? Certainly not. Both in scientific knowledge and talent our engineers are unsurpassed. The fault must be laid to the admirable organisation of 50 years ago, which is no longer suitable to the present day.

"What is most striking in M. Ferrand's pamphlet is the incapacity of the arsenals to repair vessels damaged in battle. To justify the large number of workmen employed, we have been accustomed to hear that we must have a reserve of power to meet the demands of war; but now we are told that in wartime this large *personnel* will be useless to us. Our arsenals, in fact produce nothing; they are only places for the collection of materials and putting these together. The organs of a ship—everything even to the rivets—are supplied by private firms, who therefore have alone the power of carrying out the most important and delicate repairs. But M. Bertin states that private industry will fail us in

time of war; many works will be closed and communication will be difficult. Our ships, therefore, for want of repair will be forced to lie useless in our ports, and as building work on new ships will have to cease, the dockyardmen will be thrown out of employment.

"The reasoning appears irrefutable. The arsenals, not being fitted up with tools, either for the manufacture or repair of armour plates, turrets, piping, or electrical appliances, will be unable to repair a damaged ship; we shall not be able to count on them in time of war, and as private industry will be paralysed, we shall be able to count on no one. This is really a very grave situation, which calls for immediate reform. If the Commission of the Budget could point the way instead of interfering in military questions, where its competency is doubtful, everyone would be grateful.

"So much for time of war; as for peace time, it is undeniable, as M. Ferrand says, that our arsenals cannot build our fighting ships as quickly as is now required. It is sufficient in proof of this to compare the dates of commencement and completion of recent vessels. The same class of ship which in England can be built in two years, or at most three, drags on in our arsenals for five, six, and sometimes even seven years, the result being that our squadrons are collections of various out-of-date classes. This dilatoriness is not due to a want of workmen, for, on the contrary, the dockyard *personnel* is enormous and superabundant, so that though we spend a considerable sum in wages we can only afford to pay the men small and often miserable wages. Here again the traditions of the old wooden Navy hamper us, and our workmen are badly distributed in the arsenals, which are not specialised as they should be and are in other countries.

"If we consider the number of workmen employed we see that it exceeded 27,000 in 1901, and rose to 33,000 in 1902. No other nation employs as many men. Taking Italy, in the three arsenals of Spezzia, Naples, and Venice, only 16,000 men are employed; Germany, at Wilhelmshaven, Danzig, and Kiel, employs altogether 16,000 men—7,000 less than in France; and as regards England, whose arsenals produce just one-third more than ours, we find that only about the same number of workmen are employed, namely, 30,000, and of this number only 9,000 are permanent established workmen, while we retain, in round numbers, 24,000. Thus we see that we are not deficient in workmen. It is true we cannot follow the example of England and discharge men from day to day as necessary; we have not, as she has, large private shipbuilding yards ready to take them on. Our military ports are nearly all situated in agricultural districts, and if we were to discharge men they would not be able to get a living. If we could reduce the number of workmen by 10,000 or 12,000 men, the economy would be great, and those retained could be better paid.

"In reply to those who say that if we reduce our workmen the output of the arsenals will be still less than at present, we can point to Germany, which, with a smaller working *personnel*, produces as much as we do, and to England, which, with about the same number, produces much more.

"Is it impossible to get work done in France as it is done in Germany and in England?"

GERMANY.—The following are the principal promotions and appointments which have been made:—Admiral—H.R.H. Prince Henry of Prussia

to be Grand Admiral in Command of Active Battle-fleet, and Inspector-General of the Navy. Vice-Admiral—von Prittwitz und Gaffron to Command of the Baltic Station. Rear-Admirals—Schmidt and Wodrig to be Vice-Admirals; von Holtzendorff to Command of 1st Squadron of Active Fleet; Pohl to Command of Cruiser Division. Kapitans Zur See—Pohl, Heeringen, Capelle, to be Rear-Admirals; Paschen, Commandant of the "Mecklenburg," to act as Second-in-Command of 2nd Squadron, with rank as Commodore; Rollmann, Commandant of the "Kaiser Wilhelm der Grosse," to act as Second-in-Command of 1st Squadron, with rank as Commodore; Kalau von Hofe to act as Second-in-Command of Cruiser Division, with rank as Commodore; Derzewsky to be Superintendent of Danzig Dockyard; Emsmann to be Commandant at Heligoland; Sommerwerek to "Württemberg"; Schröder to "Kaiser Wilhelm II.,"; Murwede to "Kurfürst Friedrich Wilhelm."—*Marineverordnungsblatt*.

Admiral H.R.H. Prince Henry of Prussia, who succeeds Admiral von Koester as Grand Admiral in Command of the Active Battle-fleet and Inspector-General of the Navy, hoisted his flag at Kiel on the 26th September, on board the first-class battle-ship "Deutschland." Prince Henry has a high reputation in the German Navy, and is a good tactician; he commanded for some time the battle-ship squadron in China; then the Home battle-squadron, or Manœuvre Squadron as it was for some years styled, and since vacating that position he has been in command of the Baltic Division, his headquarters being at Kiel, in which important appointment he is now succeeded by Vice-Admiral von Prittwitz und Gaffron.

Admiral von Koester, who now retires practically from active service, is in his 61st year, and has had a long and distinguished career, which has been recognised by the Kaiser's bestowal upon him of the Order of the Black Eagle, the highest decoration which he has in his power to confer. Since Admiral von Koester first assumed command of the Manœuvre Fleet in the spring of 1894, the German Navy has made enormous strides. When he took over the command from Admiral Schröder, the fleet consisted of eight ships forming two divisions, with two cruisers: the 1st Division, composed of the four battle-ships of the "Sachsen" class, which were even at that time nearly obsolete, and the 2nd Division, of the "König Wilhelm" and "Deutschland"—both older ships still—with the "Brandenburg" and "Friedrich der Grosse," the two first ships of a new type. The total displacement of the fleet amounted to 66,367 tons, manned by 5,000 officers and men. The active battle-fleet of to-day, the command of which he is vacating, consists of two squadrons of eight battle-ships each, with a total displacement of 191,200 tons and manned by 10,500 officers and men. In place of two small cruisers, the Cruiser Division now consists of 3 armoured cruisers, and 6 smaller ones, with a total displacement of 46,000 tons, and manned by 3,200 officers and men. In place of only one second-in-command, as formerly, the new commander-in-chief of the Battle Fleet has five flag officers under him.

Prize-Firing in the Fleet.—The Kaiser, who takes the greatest interest in the good shooting of his fleet, has, during the last three years, presented no less than three large silver trophies—the third for competition by the cruiser division having been presented this spring—to be competed for annually by the ships of the Active Battle-Fleet. The results of this year's competition have now been published: the "Kaiser Wilhelm der Grosse" carrying off the cup for the 1st Squadron; the "Braunschweig"

that for the 2nd Squadron; and the small third-class cruiser "Frauenlob" winning that for the Cruiser Division. During the twelve months they are held, the trophies are in charge of the captains of the winning ships. The holders of the trophies last year were the battle-ships "Zähringen" and "Elsass." In 1901 His Majesty presented a gold trophy to be competed for by the Cruiser Squadron in the Far East, which was won last year by the small third-class cruiser "Thetis." The result of this year's prize firing for this Squadron is not yet to hand.

Squadron Changes.—With the conclusion of the manœuvres, certain changes in the composition of different squadrons have been carried out. The old battle-ship "Wörth" is withdrawn from the Active Battle-fleet, her place being taken by the new first-class battle-ship "Lothringen," while the new battle-ship "Deutschland" becomes the flag-ship of the commander-in-chief. The small cruiser "Leipzig" proceeds to China, where she takes the place of the second-class cruiser "Hansa" in the Cruiser Squadron. The old torpedo training-ship "Blücher" is to be paid off, and her place taken by the "Württemberg," one of the older battle-ships of the "Sachsen" class.

Launches.—The new first-class battle-ship "Schlesien" was launched on the 29th May, from the Schichau Yard at Danzig; she is the fourth of the "Deutschland" class to take the water, the three others being the "Deutschland," "Hannover," and "Pommern," while the fifth is still on the slip at the Germania Yard, Kiel. Her principal dimensions are as follows:—Length, 430 feet 2 inches over all, 397 feet 6 inches between perpendiculars; beam, 72 feet 10 inches; mean draught 26 feet, with a displacement of 13,200 tons. The engines are to develop 16,000-I.H.P., giving a speed of 18 knots. Full details of these vessels have already been given in the JOURNAL (see Naval Notes, April No.). The new battle-ship has been built with great rapidity at Danzig, the definite orders to put her in hand having only been received towards the end of last year; but a good deal of work had been done, and most of the material collected in advance. The Schichau firm only began the work of building battle-ships at the end of last century, the "Kaiser Barbarossa," laid down in August, 1898, being their first large ship, which was followed by the "Wettin," "Elsass," "Lothringen," and now the "Schlesien."

The new first-class armoured cruiser "Greisenau" was launched on the 14th June, from the Weser Yard, Bremen. She and her sister-ship "D," still on the stocks at Hamburg, are considerably larger than any of their predecessors, as they have a displacement of 11,600 tons over the 9,500 tons of the "Roon" and "Yorck." Their dimensions are as follows:—Length, 449 feet 6 inches; beam, 70 feet 6 inches; draught, 24 feet 4 inches, on a displacement of 11,600 tons. Protection will be afforded by a complete belt of Krupp steel, 6 inches thick, 7 feet 6 inches deep, tapering to 3 inches at the extremities, with a 6-inch central redoubt, a 2-inch armour deck, while the conning tower is 8-inch. The armament will consist of eight 40-calibre 8-2-inch guns, four in pairs in two turrets, one forward and one aft, protected by 6-6-inch armour, and four in casemates, protected by 6-inch armour; six 40-calibre 5-9-inch Q.F. guns in central redoubt; twenty 3-4-inch Q.F. guns, with fourteen 1-pounders, and four submerged torpedo-tubes. The engines are to develop 26,000-I.H.P., giving a speed of 22-5 knots; the water-tube boilers being of the Thornycroft-Schultz type.

On the 28th August from the Imperial Dockyard at Kiel, and on the 22nd September, from the Imperial Dockyard at Danzig, were launched the small cruisers Ersatz "Blitz," and "O," which were named the "Nürnberg" and "Stuttgart," respectively. These vessels are an improvement on the "Hamburg" type, and with the Ersatz "Wacht," building at the Vulcan Yard, Stettin, will form a special class. Their dimensions are as follows:—Length, 355 feet, as against 340 feet 6 inches in the "Hamburg"; beam, 44 feet, as against 43 feet 3 inches; draught, 15 feet 6 inches, with a displacement of 3,400 tons, as against 3,250. The engines are to develop 13,600-I.H.P., giving a speed of 24 knots, as against the 10,000-I.H.P., and 22 knots of the earlier class. The armament will consist of ten 40-calibre 4.1-inch Q.F. guns, with eight 1.7-pounders. The Ersatz "Wacht" is to be fitted with turbine engines on the Parsons system. In addition to the Ersatz "Wacht," two other cruisers, improvements upon the "Wacht" Class, the Ersatz "Pfeil," and Ersatz "Komet," are under construction at the Imperial Dockyards at Danzig and Kiel respectively. Their dimensions will be:—Length, 387 feet; beam, 51 feet; displacement, 3,500 tons, on a mean draught of 15 feet 6 inches, with a speed of 24 knots.

From the Germania Yard, at Kiel, was launched last May the destroyer "G 132," being the first of the series, "G 132" to "137." These vessels are to have a displacement of 406 tons, with engines developing 6,000-I.H.P., to give a minimum speed of 27 knots. Their length will be 208 feet 4 inches, with a beam of 22 feet 6 inches, and a draught of 8 feet 3 inches; the armament will consist of four 2-inch Q.F. guns, throwing a 48 lb. projectile, being one gun more than previous boats have carried. "G 135" is to carry, as an experiment, a 3.4-inch gun, throwing a 19.8 lb. projectile, in place of the two other 2-inch guns. "G 137" is to be fitted with the Parsons turbine engines, and will have a displacement of 572 tons, while she is to have a speed of 30 knots. Three other destroyers of this series have since been launched; "Nos. 134, 135, and 136," all from the Germania Yard at Kiel. "G 132" is now ready for her trials.

From the Schichau Yard at Elbing was launched on the 22nd September the destroyer "No. 138," the first of the two divisions of destroyers of the 1906-07 Programme to take the water. These vessels have a displacement of 530 tons, with engines developing 10,000-I.H.P., to give a speed of 30 knots, steam being generated by four boilers, and the engines being Parsons turbines; the previous series of 406-ton destroyers are only fitted with 3 boilers. The torpedo armament of the new series will consist of 3 submerged torpedo-discharges, and they will also carry an 8.8 cm. (3.4-inch) Q.F. gun, throwing a 19.8 lb. shell, and four 4.8-pounders with two machine guns.

New Ships.—The preparations are now complete for the laying down at the Imperial Dockyard, Kiel, of the new first-class armoured cruiser "E," which is to have a displacement of 15,000 tons, and will be more than 4,000 tons larger than the "Fürst Bismarck," which has been, up to now, the largest armoured cruiser in the German Navy. Good progress is also being made in the same Yard with the small cruisers "Königsberg" and "Nürnberg," the first-named of which is to be ready for her trials next spring. It may be noted that the latest type of these so-called small cruisers have now reached a somewhat heavier displacement than the English second-class cruisers of the "Latona" type, built under the Naval Defence Act of 1889, while they are 87 feet longer,

have 8 feet more beam, with engines developing 13,600-I.H.P., giving a speed of 24 knots, as against the 9,000-I.H.P., and 19·5 knots of their English prototypes.

At the Germania Yard, Kiel, the new first-class battle-ship "Q" will be launched in December, and is to be ready for her trials in the spring of 1908; she is the last of the 13,500-ton battle-ships of the "Deutschland" class to take the water, as the vessels of this year's programme are to be of the new 18,000-ton type, one of which is to be laid down in this Yard, and the other in the Imperial Yard at Wilhelmshaven. The Germania Yard has also a half-flotilla—6 boats—of destroyers under construction.

The following vessels are under construction :—

Name.	Displacement.	Where building.	Remarks.
<i>Battle-ships.</i>			
"Pommern" ...	13,200	Stettin	Launched Dec. 2, 1905.
"Hannover" ...	13,200	Wilhelmshaven ...	" Sept. 26, "
"Schlesien" ...	13,200	Schichau Yard, Danzig	" May 25, 1906.
"Q" ...	13,200	Germania Yard, Kiel...	Building.
Ersatz "Bayern" ...	19,000?	Wilhelmshaven ...	Ordered.
" " "Sachsen" ...	19,000?	Germania Yard, Kiel...	"
<i>Armoured Cruisers.</i>			
"Gneisenau" ...	11,600	Bremen	Launched June 14, 1906.
"Scharnhorst" ...	11,600	Hamburg	" Mar. 22, "
"E" ...	15,000	Imp. Dockyard, Kiel...	Ordered.
<i>Protected Cruisers.</i>			
"Danzig" ...	3,200	Imp. Dockyard, Danzig	Launched Sept. 23, 1905.
"Koenigsberg" ...	3,200	" Kiel ..	" Dec. 12, "
"Leipzig" ...	3,200	Bremen "	" Mar. 22, "
"Nürnberg" ...	3,400	Imp. Dockyard, Kiel...	" Aug. 28, "
"Stuttgart" ...	3,400	" Danzig	" Sept. 22, "
Ersatz "Wacht" ...	3,400	Vulcan Yard, Stettin	Building.
" "Pfeil" ...	3,500	Imp. Dockyard, Danzig	"
" "Komet" ...	3,500	" Kiel ...	"

Steam Trials.—The new first-class battle-ship "Deutschland" has successfully completed a 22 hours' coal consumption trial, and her 6 hours' full speed trial under forced draught. During the 22 hours' trial the engines developed 11,377-I.H.P., making 99·8 revolutions, and giving a mean speed of 17·1 knots, with a coal consumption of 800 gr. (1·75 lbs.) per indicated horse power per hour, and an air pressure in the water-tube boilers of 18·3 mm. (.75 inch); during the 6 hours' full-speed trial the engines developed 16,939-I.H.P.—nearly a 1,000-H.P. over the contract (16,000)—making 111·5 revolutions and giving a mean speed of 18·5 knots, with an air pressure for the cylindrical boilers of 10·8 mm. (.40 inch), and of 42·3 mm. (1·75 inches) for the water-tube ones, the ship being fitted with 6 cylindrical boilers and 8 water-tube of the Schultz-Thornycroft type, the coal consumption being 814 gr. (1·80 lbs) per indicated horse power per hour. The pitch of the three screws is 6·5 metres (19·66 feet). The mean draught of the ship during the forced draught trial was 25 feet, and the highest speed attained 18·8 knots. During an eight hours' trial with the water-tube boilers alone, the engines developed 14,227-I.H.P., with an air pressure of 52 mm. (2 inches), giving a mean speed of 17·75 knots.

The new first-class battle-ship "Lothringen" has also completed her trials successfully. During the 24 hours' coal consumption trial, with

the engines developing 11,574-I.H.P., and making 100·2 revolutions, a mean speed of about 16·6 knots was maintained, with an air pressure for the water-tube boilers of 13·7 mm. (·50 inch), and a coal consumption of 756 gr. (1·65 lbs.) per indicated horse power per hour. At the 6 hours' forced draught trial, with the engines developing 16,590-I.H.P.—590 over the contract—and making 112·7 revolutions, a mean speed of 18·5 was maintained, with a coal consumption of 839 gr. (1·84 lbs.) per indicated horse power per hour.

The new first-class armoured cruiser "Roon" has completed successfully her 6 hours' forced draught trial, when the engines developed 20,62½ I.H.P.—1,625-I.H.P. over the contract—making 118 revolutions, giving a mean speed of 21·17 knots, with a mean air pressure of 32·5 mm. (1·30 inches). The pitch of her screws is 6·8 m. (19·75 feet), like the "Yorck's," having been altered from a pitch of 6·5 m. (19·66 feet) after her first trials, when the highest speed reached was only 20·37 knots.

The new third-class cruiser "Leipsic" has completed her 24 hours' coal consumption trial, with the following results:—With the engines developing 7,140-I.H.P., and making 122·05 revolutions, a mean speed of 20·4 knots was maintained, with an air pressure of 19·2 mm. (·80 inches), and a coal consumption of 90 gr. (·20 lb.) per indicated horse power per hour.—*Marine Rundschau* and *Neue Preussische Kreuz Zeitung*.

UNITED STATES.—*Launch of the "New Hampshire."*—The new first-class battle-ship "New Hampshire" was launched on the 30th June from the yard of the New York Shipbuilding Company. Her dimensions are as follows:—

Length on load water-line, 450 feet; beam, extreme, at load water-line, 76 feet 10 inches; displacement on trial, not more than 16,000 tons; mean draught to bottom of keel at trial displacement not to exceed 24 feet 6 inches; total coal bunker capacity, about 2,350 tons; coal carried on trial, 900 tons; feed water carried on trial, 66 tons; hull of steel throughout; speed 18 knots, with a premium for increase and a penalty for decrease, the vessel to be rejected, or accepted at a reduced price if it falls below 17½ knots. The armament is as follows:—

The main battery, four 12-inch B.L. rifles in pairs, in two electrically controlled, balanced, elliptical turrets, on the centre line, one forward and one aft, each with an arc of fire of about 270°; eight 8-inch B.L. rifles in pairs, in four electrically controlled, balanced, elliptical turrets, two on each beam at each end of the superstructure; twelve 7-inch B.L. rifles in broadside, on pedestal mounts on the gun deck behind 7-inch armour, each gun being isolated by splinter bulkheads of nickel steel of from 1 to 2 inches thick; forward and after guns arranged to fire right ahead and right astern respectively; other 7-inch guns to have the usual broadside train. The guns of the secondary battery in commanding positions, having a large arc of unobstructed fire, and protected wherever practicable, are as follows:—Twenty 3-inch, 14-pounder Q.F., guns, twelve 3-pounder semi-automatic guns, four 1-pounder semi-automatic guns, two 3-inch field pieces, two machine guns, calibre ·30, and two automatic guns, calibre ·30.

All the 7-inch guns are so arranged that their muzzles train inside the line of the side armour, thus leaving a clear and unobstructed side when it is desired to go alongside a pier or vessel. Arrangements will be made whereby the 3-inch guns on the main deck can be quickly and conveniently dismounted, housed, and secured; all dismounting gear to

be supplied by the contractor. Four torpedo-tubes and accessories will be installed, two each in forward and after submerged torpedo rooms.

The hull is protected at the water-line by a complete belt of armour 9 feet 3 inches wide, having a uniform thickness of 9 inches for about 285 feet amidships, gradually decreased to 4 inches at the stem and stern. The lower casemate armour extends to abreast the 12-inch barbettes, and reaches from the top of the water-line belt to the lower edge of the 7-inch gun ports on the gun deck, and is 7 inches in thickness, the athwartship bulkheads at the ends of this casemate being 7 inches thick. The casemate armour around the 7-inch guns on the gun deck is 7 inches thick, and the splinter bulkheads are from 1 to 2 inches thick. The protection of 3-inch guns is nickel steel 2 inches thick. The upper and lower casemate athwartship armour extending from the shell plating to the 12-inch barbettes is to be 7 inches thick throughout. The 12-inch barbettes extend from the protective deck to about 4 feet above the main deck, and consist of 11 inches of armour in front and 7½ inches in the rear above the gun deck, and 6 inches between berth and gun decks. The athwartship and barrette armour will not have any special framing, the connection of the armour to the decks being sufficient. The 12-inch turrets will have a front plate 12 inches thick, rear plate 8 inches thick, and top plate 2½ inches thick. The 8-inch barbettes will be 6 inches thick in front and 4 inches thick in rear, with the upper tube 3½ inches thick and the lower tube 3 inches thick. The 8-inch turret front plate will be 6½ inches thick, the rear plates 6 inches, and the top plates 2 inches thick. The conning tower will be 9 inches thick, door 6 inches thick, signal tower 6 inches thick. An armour tube 36 inches in diameter will extend from the base of the conning tower to the protective deck, and will be 6 inches thick throughout. One torpedo-directing station, 5 inches thick, will be fitted near the conning tower. The directing station for after torpedo-tubes will be located in the signal tower. Teak backing of a minimum thickness of 3 inches will be fitted behind all side and 12-inch turret armour; 2 inches of backing to be fitted behind the 8-inch turret armour; other armour will be fitted without backing. There is a complete protective deck extending from stem to stern, the deck being flat amidship, but sloped at the sides throughout, and sloped at each end. It will be built up of 20 lb. plating throughout, with nickel steel of 40 lbs. on the flat, except it will be 80 lbs. forward and abaft 12-inch barbettes over magazine, and of 100 lbs. on the slopes.

The engines will be of the vertical twin-screw four-cylinder triple-expansion type, of a combined I.H.P. of 16,500, and arranged for out-board turning propellers when going ahead. The steam pressure will be 250 lbs.; the stroke will be 4 feet. The cylinder diameters will be sufficient for the required I.H.P. at about 120 revolutions per minute. Each engine will be located in a separate water-tight compartment. There will be twelve water-tube boilers, of the Babcock and Wilcox type, placed in six water-tight compartments. There will be not less than 1,100 square feet of grate and not less than 46,750 square feet of water-heating surface. The working pressure will be 265 lbs. The length of grates will be about 6 feet 9 inches. There will be three smoke pipes, each 100 feet high above the base line.

Water tanks for potable water will be provided for a capacity of 8,000 gallons forward and 7,000 gallons aft, and gravity tanks 2,000 gallons. The vessel will be lighted throughout by electricity.

With the exception of the auxiliaries operated by steam, all power will be electric. There will be thirty-three blowers for forced ventilation with a capacity of 104,000 cubic feet a minute. The capacity of the coal bunkers is 2,350 tons. The vessel will be fitted as a flag-ship, to carry 41 officers, 815 men, and 60 marines. The two steel masts will be arranged for wireless telegraphy. There will be one signal yard on each mast, a search-light platform forward and aft, with a look-out platform on foremast, and approximately thirty-five sliding water-tight doors and six armour hatches, worked on an approved system by power.

The following is the summary of weights to be carried on trial:—Guns, mounts, magazine, equipments, etc., 1,063·10 tons; ammunition, two-thirds cruising supply, 405·50 tons; steam engineering complete, not to exceed 1,500 tons; engineering stores, two-thirds full supply, 26·67 tons; reserve fresh water for steaming purposes, 66 tons; coal, normal supply, 900 tons; boats and outfits, 51·27 tons; masts and spars, 31·09 tons; equipment complete, 359·68 tons; miscellaneous stores and water, two-thirds supply, 81·32 tons; provisions, clothing, and small stores, two-thirds full supply, 144·25 tons; officers, crew, and effects, 109·85 tons; total protection, 3,935·23 tons.—*U.S. Army and Navy Journal*.

MILITARY NOTES.

HOME.—The following are the principal appointments which have been made:—

Generals—His Majesty has been graciously pleased to appoint H.R.H. George F. E. A. Prince of Wales and Duke of Cornwall and York, K.G., K.T., K.P., G.C.S.I., G.C.M.G., G.C.I.E., G.C.V.O., I.S.O., to the Honorary Colonelcy of the 1st Cinque Ports Volunteer Rifle Corps.

Lieut.-Generals—A. S. Wynne, C.B., from Commanding the 6th Division, to be Military Secretary to the Secretary of State for War, and Secretary of the Selection Board. Sir W. G. Nicholson, K.C.B., Q.M.G. to the Forces (Third Military Member Army Council), to be General.

Major-Generals—H.E. Maharaja Sir Chandra Shamsher Jang, Rana Bahadur, G.C.S.I., is granted the honorary rank of Major-General in the Army. J. M. Grierson, C.V.O., C.B., C.M.G., from Director of Military Operations, to Command the 1st Division. W. E. Franklyn, C.B., to be Colonel of Alexandra, Princess of Wales's Own (Yorkshire Regiment). T. A. Cooke, C.V.O., to be Colonel of the 5th (Royal Irish) Lancers.

Colonels—G. K. Scott-Moncrieff, C.I.E., from h.p., to be an Assistant-Director at Headquarters. J. S. Ewart, C.B., from Military Secretary to the Secretary of State for War, and Secretary of the Selection Board, to be Director of Military Operations at Headquarters, and to be Major-General. G. F. Browne, C.B., D.S.O., Director of Personal Service, to be Major-General. G. M. Bullock, C.B., Commanding Army of Occupation in Egypt, to be Major-General. H. C. Selater, C.B., Q.M.G. in India, to be Major-General. A. W. Hill, C.B., from Commanding 41st

Regimental District, to be a Brig.-General, to Command the Welsh Border Grouped Regimental District. J. H. Campbell, from h.p., to be a Brigadier-General, to Command a Grouped Regimental District. J. Adye, C.B., from R.A., to be an A.A.G. T. F. Bushe, C.M.G., R.A., to be an Assistant Director at Headquarters.

By the kind permission of Mrs. A. E. Wintern, the following account is taken from the work of the late Colonel C. Walton, C.B. :—

COLOURS, "THE COLDSTREAM REGIMENT OF FOOT GUARDS,"
1684.

AUTHORITIES AND NOTES.

Shape, Size, etc.—See Chap. XXIII. on Regimental Economy.

Colouring, Devices, etc.—Nathan Brooks; "Flies St. George's Cross, bordered with white in a blue field."

Sandford, 1685; "The Colours or Ensigns of this Regiment had been of blue taffata; the Colonel's without distinction; the Lieutenant-Colonel's with a white plain cross throughout, surmounted by a cross of crimson taffata or cross of St. George; as were the ten other ensigns. Only the Major's ensign was distinguished by a white pile wavy issuing out of the canton of the first quarter, and the several Captains by numeral letters, viz., the eldest by I., the second by II., the third by III., and so to the youngest or ninth Captain, who had IX., all painted in white on the dexter cantons of the first quarters. These ensigns were devised by Mr. Francis Sandford for his Grace George, late Duke of Albermarle, when he commanded this regiment, and approved of by His late Majesty King Charles the Second, and by His present Majesty when Duke of York." (The Duke of Albermarle died in 1670.)

Royal Warrant, 15th September, 1680, Harl. MSS.5752, is an authority for payment for one Colour for the Earl of Craven's Regiment, and includes 4 Ells blue taffata, 2 Ells white, and 2 Ells crimson, painting in oil two figures of distinction, gilding in oil the head of the Ensign, and one tassell.

GERMANY.—*Criticisms on the Grand Manœuvres.*—On the conclusion of the Grand Manœuvres the German Emperor made a critique, which the *Neue Militärische Blätter* summarises as follows :—

The Infantry always manœuvred skilfully, and the new drill regulations appear to have exercised a favourable influence on the progress of the fighting, for the lines of skirmishers, as well as the units following them, made use of all the formations for taking proper advantage of the ground to close with the enemy.

The Cavalry divisions manœuvred fairly satisfactorily. It would appear that regiments of this branch of the service are unable to accustom themselves to manœuvre assembled in large units. At the same time, it must be recognised that the cavalry made advantageous use of its firearms, especially on the second day of the manœuvres, in the course of which the "A" Cavalry Division, which had deployed all its regiments, with the exception of its flank guards, for dismounted action, vigorously attacked

General Woyrsch in reverse, and worried him considerably, in conjunction with its artillery and machine gun fire.

The Artillery manœuvred well; it was always brought up in time at the desired spot, and made great use of the spade, which shows a decided improvement with regard to former times, when the artilleryman, and the cavalry soldier, looked upon the pioneer's tool and the carbine as unnecessary accessories.

The Cyclist detachments were only employed to a limited extent, generally as flankers or for carrying orders.

Automobiles were more used than formerly; they played an important part in establishing a direct connection between the direction of manœuvres and the umpires.

Telephone and Telegraph detachments worked with remarkable rapidity, and with great skill, to such a pitch as regards these that, as regards both *matériel* and the training of the men, we can challenge comparison with all other Powers.

The Transport and Commissariat services were well carried out.

In short, in the Emperor's opinion, the Grand Manœuvres proved that the German Army, both as regards *matériel* and men, and the command and training, are equal to the exigencies of modern war.

The *Danzer's Armée-Zeitung* has been recently devoting a series of articles, manifestly from the pen of an eye-witness to the German Imperial Manœuvres in Silesia. For the most part, this account is very eulogistic, and recognises the undeniably good points of the German Army, but at the same time it contains some criticisms which, owing to the obviously very friendly spirit of the author, have all the more force. Thus, after recognising that the various formations were employed in the infantry, with the greatest independence, by battalions and by even larger units, the following serious observations on the attack itself are made:—

“The carrying out of the infantry attack pleased us less. One could not help observing a certain stiffness and lack of flexibility, which are peculiar to the troops. The terrain frequently demanded greater elasticity in the formations, and a better adaptation of the latter. The attacks were decided with far too great rapidity; this, however, is the same elsewhere, and as the manœuvre cannot be indefinitely prolonged, it is not always possible to avoid this; at the same time, more especially in the actions round fortified positions, they erred too much in this regard.

“On the second day of the manœuvres we found ourselves on the heights at Malitsch at the moment when the decisive shock of the left flank of the VIth Army Corps was delivered. The defender was well sheltered; a portion even were placed in covered trenches, and could get to the principal position by covered communications. In front of the infantry position there was a network of wire. The assailant, emerging from the depression of the Weidelache, advanced on this position. The thick and unbroken swarm of skirmishers soon reached about 200 yards of the enemy; then only was the advance stopped, but the re-enforcements came up in a constant stream, so that four or five thick lines of skirmishers were seen advancing one behind the other. Finally the assault was delivered after the rupture had been prepared for some time by means of the firing. The assailant then hurled himself against the hostile trenches, on a front of several hundred paces, and being at least six ranks deep. These masses first came to the wire network and remained standing until it had been cut, and then continued the movement against the trenches. Behind these masses, which were like living

targets, one perceived more reserves climb the heights in compact masses one behind the other. We saw many other instances of infantry exposing itself to fire in compact formations."

The German artillery, too, did not thoroughly satisfy the Austrian officer:—

"New regulations have not yet been issued," he says, "for the German artillery in action; one should, therefore, not be surprised if their method of operating, during the manœuvres, did not come up to modern principles. One frequently saw batteries in the open or taking up a position on points on the terrain plainly discernible and easy to discover. The taking up of the position itself was not always carried out in conformity with the conditions of war, and was sometimes effected with considerable slackness. We more than once saw, from the enemy's position, the silhouettes of guns coming into position, expose themselves on the horizon."

With regard to the German cavalry at the manœuvres, Colonel Gädke, writing in the *Berliner Tageblatt*, says:—

"I am quite unable to suppose that the foreign officers, with a military eye, received an extremely favourable impression of the mobility, the resolution, and the skill of our cavalry commanders, and of the efficiency of our cavalry in the execution of the strategic service of reconnaissance and security. The day passed altogether conventionally, and certain episodes were of an almost comic character Our superb cavalry is far too artificially trained to the rôle of the principal arm in battle, and, in consequence, it neglects scouting and fire action, the importance of which is so great. In addition, the wastage in patrols and orderlies was enormous, and the effectives of squadrons was thus terribly reduced. What is even still worse, the patrols always carry out their service with a certain *nonchalance*, and give the impression that they don't understand the gravity of the duty. I have even seen officers' patrols halt between masses of the enemy; I have observed others pass at a trot along the whole length of, and at 50 paces from, a fortified position, although they were being fired at from it. I have seen others halt close to groups of spectators when masses of the enemy were within 100 yards of them, and then quietly place their horses in a ditch, so as to be able to mount more easily. . . ."

Artillery Field Matériel 96 n/A. — From February to May, 1906, eight German Army Corps, viz.:—the Guard, 1st Bavarian, XIVth, XVth, XVIth, VIIth, XIIIth, and XVIIIth, have exchanged their 96 Matériel for a new type Matériel, 96 n/A (*neuer Art*). The exchange has been carried out in:

50 brigade divisions of field artillery of 3 batteries each.

3	"	"	"	"	2	"	"
2	"	"	horse	"	3	"	"
4	"	"	"	"	2	"	"

On a war footing the German Battery consists, as formerly, of 6 guns, 6 ammunition wagons, and 5 service wagons. It can dispose of 780 rounds, or 130 rounds per gun. With light columns the total number is 1,132 rounds per battery, or 188.6 per gun, 343 rounds with those with the Corps Ammunition Columns.

The artillery of the Army Corps consists, as before, of 24 batteries, distributed between the 2 divisions, at the rate of a brigade of 2 regiments

of 6 batteries each. In half the divisions 3 light howitzer batteries replace the 3 gun batteries. In 9 divisions out of 46 there are 3 horse instead of 3 field batteries. The gun is on a carriage with spring recoil mounting. The 96 tube has been utilised with the new wedge fermeture of one single movement. The former had two movements. The gun carriage consists of a cradle with hydraulic brake and recuperator with metallic springs, a gun carriage, so to say, with two iron brackets in the form of a U, a fixed trail-spade, revolving seats for the layer and firer, a continuous shield, a recoil check (travelling brake) and two axle tree seats. The wheels of the 96 matériel, which have been well proved, have been retained.

The shield is formed in three parts: a centre part with gun embrasure and a hole for aiming; an upper and a lower part hinged on to the centre part, and which can be raised or lowered on the march. The aiming apparatus is carried on the cradle. The independent line of sight has not been adopted, but an aiming arrangement with the use of a telescopic sight has been perfected.

The limbers are of the same form as those of the 96 model; they contain 36 rounds. The gun in battery weighs 950 kilograms (18½ cwt.). The gun and limber of the 96 n/A Matériel, in spite of its shields, only weighs about 50 kilograms (110 lbs.) more than the similar carriage of the 96 Matériel. The old caisson, provisionally retained in service, consists of a limber identical with that of the gun and a hind carriage with 52 rounds. The ammunition is the same as that of the old gun. The shrapnel weighs 6'850 kilograms (15 lbs. 2 ozs.) and contains 300 bullets of 10 grs. each (353 oz.). The double-action fuse is graduated up to 5,000 metres (5,465 yds.), and is adjusted by hand. The initial velocity is 465 metres (491 yds.).—*Précis from Jahrbücher für die deutsche Armée und Marine and the Militär Zeitung.*

New Pension Regulations.—A recent law has introduced some very great changes in the retiring pensions of German officers and Non-commissioned officers, which have been considerably increased.

Officers.—According to these regulations: a lieutenant, after 10 years' service will, in future, receive annually 753, instead of 488 marks; a first lieutenant will receive 1,180 marks instead of 850, after 15 years' service; a 2nd class captain, after 20 years' service will receive 2,214 marks instead of 1,735; a 1st class captain, after 25 years' service will receive 3,285 marks, instead of 2,682; a major, after 30 years' service, will receive 5,052 marks, instead of 4,091; a brevet lieutenant-colonel, after 35 years' service, in the event of his not being in command of a regiment, will receive 6,546 instead of 5,442 marks; a brigade commander, after 40 years' service, will have an annual pension of 9,387, instead of 9,006 marks; generals of division and generals commanding army corps will in future receive a fixed pension of 12,000 marks. Allowances for number of years' service and of functions exercised may increase this sum by two-thirds; in other words the maximum pension to be obtained is 20,000 marks.

A retired officer who is badly off may receive supplementary grants bringing his annual pension up to 1,200 marks for a lieutenant, 1,800 marks for a 1st lieutenant, and 2,400 marks for a captain. The regulations also provide for the case of an officer who has left the Army before he has completed 10 years' service and who is not entitled to a pension and who is badly off; in this case he may be awarded a pension not exceeding twenty-sixtieths of his last pay. Retired officers employed in the military situations which are reserved for them, benefit by the

increase of pension laid down for those who have over 10 years' service. It is the same for officers called out on mobilisation. In this latter case the annuity commences as soon as the officer has completed 60 days with the colours. An officer's service is counted from the day he enters the Regular Army up to the end of the month in which he leaves the service. Service before the age of 18 does not count unless it has been passed on active service in the field. A year is added to the service of every officer who has taken part in a campaign, bearing in mind that more than one campaign undergone in the course of one year does not entitle the officer to more than a year's seniority. Service outside Europe is counted double, if the period has been for at least a year without interruption. This advantage is not given in addition to seniority awarded for war service.

On the death of an officer entitled to a pension, his widow or his children receive a quarter of that pension paid once and in advance. This grant is independent of the pensions to which widows and orphans are entitled.

Non-Commissioned Officers and Men.—The life annuities for disabled privates, corporals, sergeants, and sergeant-majors, have been increased respectively from 396, 432, 468 and 540 marks, to 540, 600, 720, and 900 marks. For those who have lost the use of their limbs an annual increase of 27 marks is given for limb lost. In case of grave disablement a soldier's pension may amount to 1,188 marks a year. Re-engaged men will receive, in future, after 18 years' service: a sergeant, 360 marks instead of 180; a sergeant-major 450 marks, instead of 250; an assistant bandmaster, 510 marks instead of 321. The same non-commissioned officers, on 35 years' service, will receive respectively 720, 900 and 1,575 marks. Grants awarded to non-commissioned officers having less than 12 years' service and who have not entered into civil employ, for reasons of health, as well as those awarded to discharged privates, consist of a special pension. This pension is calculated and regulated according to the number of years' service, and according to the diseases contracted; it may amount to 216, 240, 288, and 360 marks, to which may be added the pay obtained in civil employment. Re-engaged men of less than 18 years' service may obtain pay amounting to 2,000 marks at most, including the pay drawn from civil employment. It is understood that this amount may be increased according to the diseases contracted.—*Précis from La France Militaire and Revue Militaire des Armées Etrangères.*

ITALY.—Alpine Group Manœuvres.—These manœuvres took place to the west of Lake Garda, in the direction of the Via del Giudicaria. This portion of the Italian frontier is not of such importance, from the Austrian side, as the eastern sector. Upon the latter would certainly be delivered the chief Austrian attack, if there were no serious obstacle from the Italian side, and if, on the other hand, the means of approach were perfected and numerous from the Austrian side. Nevertheless, it was of use to study, in the western sector, an accessory offensive of the enemy as well as the Italian means of offence. If account is taken of the steady increase in Austria's military preparations, as regards training, increased occupation effective, construction of new fortified works, the opportuneness and utility of these manœuvres will be recognised.

The Northern, or invading, Force consisted of: the Pisa Brigade (29th and 30th Infantry Regiments) and the Valtelini Brigade (65th and 66th Regiments); 4 Alpine battalions (Tiracio, Edolo, Vestone, Morbegno);

a field artillery brigade division of 75 cm. steel field guns; 2 mountain batteries, and 2 squadrons of light cavalry.

The Southern, or defending, Force consisted of: the Lombardy Brigade (73rd and 74th Regiments), the 12th Bersaglieri Regiment, the 6 Alpine battalions (Mondovi, Cera, Pieri di Teco, Bassano, Verona, and Vicenza), 6 mobile companies of Alpine militia, a field artillery brigade division, 2 mountain batteries, and 2 squadrons of light cavalry.

The lines occupied by the two forces at the commencement of the manœuvres were, as regards the Northern Force, from the Maniva Pass to Salo on Lake Garda, passing through Vestone, Presegla, and Vobarno: as regards the Southern Force, a frontage of the same length, extending from the passes to the north of Brescia, down to Decenzano. The general idea supposed a victorious offensive of the Northern Force, the Southern Force having been forced to retire to a position selected beforehand; it there received re-enforcements, which permitted of its adopting a counter-offensive, re-attack the advanced positions, and to drive back the enemy.

The hostilities lasted from the 21st to the 28th August; they consisted, for the first two days, of small affairs of outposts; the contact then became closer, and a series of energetic actions transferred hostilities to close to the Austrian frontier. General Saletta followed these manœuvres and profited by them to inspect the frontier districts. New fortifications will shortly be erected there.

As in all preceding years, experiments of a new *matériel* were made during these manœuvres. Amongst others two new sorts of valise were tried, viz., a modified regulation valise and a knapsack. A new uniform for the Alpine troops, of a grey tint, was also tried, as well as a new method of packing equipments. These latter trials gave excellent results, especially that of the grey uniform from the point of view of visibility. In the mountains, where there are numerous and favourable points of observation available, it is of advantage to have a uniform which escapes observation as much as possible, which was certainly the case with the uniforms under trial. The troops which received them were frequently able to get sufficiently near to the enemy, unperceived, and to surprise him advantageously. The 1st Alpine Regiment was also supplied with a Maxim machine gun, as a tentative measure. The experiment was most encouraging. Finally, experiments were also conducted in the lightening of the infantry soldier's load.

Organisation of the Colonial Army in Eritrea.—The Royal Decree of the 22nd September last, re-organising the administration of Eritrea, contains the following clauses regarding the Army:—

The defence of the Colony is entrusted to a "Royal Corps of Colonial Troops," as well as to the battle-ships stationed in the Red Sea.

The Royal Corps of Colonial Troops consists of Italians and Natives, on permanent service and on leave. The troops on permanent service consist of officers and men of the Royal Italian Army, and selected in preference from those applying for it. The troops on leave consist of all officers on leave (non-combatant, in excess, of the mobile, and of the territorial militia, etc.), and of all men on unlimited furlough, to whatever category or class they may belong, who reside in the territory of the Colony.

Natives are recruited by voluntary enlistment. These soldiers contract one or several engagements, on the conclusion of which they pass

into the category of troops on leave (mobile militia) and remain in it as long as they are fit for service.

Parties of Irregular troops, paid by the Government, also participate in the defence of the Colony, as well as natives fit for service, who, for various reasons, are not liable to compulsory military service.

A commandant is placed at the head of the Royal Corps of Colonial Troops charged with the defensive preparation of the Colony, and with the supervision of the organisation, training, and discipline of the Colonial troops. This commandant has the same powers as those conferred on division commanders. The commandant of the troops, as well as the commandant of the guard-ship at Massowa, is under the civilian Governor of Eritrea, this functionary being at the head of all the departments. At the same time, when, on instructions received, the Governor orders warlike operations, the conduct of them is entirely in the hands of the commandant of the troops or of the guard-ship, if it is a question of naval operations. The co-operation of authority, and of the military services (especially as regards the engineers and the medical) is under the Government, and the administration of the Colony.

The administration of the Royal Corps of Colonial Troops is exercised by a board, presided over by the commandant and acting according to the regulations in force. All matters relating to the *personnel* (officers and men), are directly under the commandant of the troops.

Formation of a Military Automobile Section. — A special military automobile section has recently been formed at Rome and attached to the Railway Battalion. The soldier to drive the petrol motors will have to go through a course of instruction under the supervision of the commander of the Railway Battalion. This course will be divided into two periods. The object of the first course, of a maximum duration of three months, is to instruct the pupil chauffeurs in the construction, the mounting and the repair of the different portions of the carriages, and in motor trials. This period of instruction will be carried out, in the present instance, at one of the national motor factories; when the military authorities buy the motors, they will, consequently, require the signature to a contract by which the constructing firm undertake to receive a certain number of soldiers into its work to train them, as mentioned above. Whilst at the works these soldiers will be under the same disciplinary rules as the civilian workmen, and will be under the heads of the factory and the foremen of the works.

The second period of instruction will be carried out with the detachment of the Railway Battalion at Rome, and its object will be to accustom the pupils to the driving of petrol motors and to instruct them on the following points: theoretic rules for good driving, and for the upkeep of the carriages; accidents and methods of curing them; general instruction of the physical geography of Italy; general instruction in map reading, on the method of consulting the "Touring Club" guides; general instructions in writing up diaries; rules regarding regular responsibility and the rules to be followed by single carriages.

When the first period is completed, the pupil-chauffeurs will pass an examination the programme of which will be fixed by the commander of the Railway battalion. Those who have profitably gone through their stay at the works will be allowed to go through the second period; the others will be sent back to the ranks. In proportion as they appear to

have acquired the necessary facility, the pupils of the second period will pass an examination before a Board, selected by the Commander of the Railway Battalion, which will classify the candidates as "very good," "good," "fair," "incapable." The pupils declared fit will be nominated military chauffeurs and, according to the exigencies of the service, will be attached to the carriages or to the workshop of the Rome detachment, or else will return to their companies and await employment. Those found unfit will remain permanently in the ranks.

The military chauffeurs will receive a certificate and will be entitled to a special allowance. Should there be some amongst the pupils found to have a sufficient knowledge of motors before their entry into the service, they may be dispensed from the first period of the course by the Commander of the Railway Battalion. Military chauffeurs, when on duty, are provided with the following: leather cap with fittings, goggles, clothing of special cloth; waterproof cloak; long blue linen blouse; black woollen gloves; railway troops' shoes according to measure.

Military chauffeurs wear a yellow metal badge of a motor on the cap and left sleeves of the tunic.—*Revue Militaire Suisse, Revue du Cercle Militaire, and Giornale Militare Ufficiale.*

RUSSIA.—*Requisitioned Horses, and what was done with them on Demobilisation.*—The *Ruskii Invalid*, in a recent number, went into the question of the horses (about 300,000) which were in excess on demobilisation.

The greater number of these horses were drawn by requisition, and supplemented by direct purchases made, more especially, in Siberia and in the Far East. There were nine partial mobilisations in Europe in 1904 and 1905, viz.: 3rd May, 9th and 29th June, 18th August, 6th September, 16th October, and 15th December, 1904; and the 23rd June, and 19th August, 1905, without including requisitions of secondary importance. The requisition of horses was made use of throughout the whole of the territory of Russia in Europe, with the exception of the North, and North-Western Districts, and those of Finland, the Caucasus, and a large portion of the Varsovie Military District.

The price of requisitioned horses, varying according to circumstances, was fixed by a staff circular of 1902 at 190 to 240 roubles (about £20 to £25) for saddle horses; 170 to 200 roubles (about £18 to £20 10s.) for horses for artillery; and 110 to 130 roubles (about £12 to £13) for transport horses. In the Kazan District the prices were from 30 to 40 roubles less (£3 to £4). These conditions were advantageous for the sellers, especially so for the peasants, who provided the transport horses.¹ Direct purchase at a fixed sum was employed in Europe for the mobilisation of the Caucasus Cossack division, and for certain branches of the service, in particular, the artillery.

In Siberia the horses of the IVth Army Corps were bought by contract, as well as these of Cossack units; then the law regarding requisition having been extended to Tomsk, Tobolsk, Trkutsk, and Yénisséi, requisition was made for about 8,000 horses; the remainder was purchased from dealers. In the Imperial Lieutenancy, the work was carried out by contract; in order to bring the troops already in the Far East to a war

¹ According to the tariffs, the prices of transport horses varied from 50 to 100 roubles (about £5 to £10). As a rule a number of horses superior to requirement were brought forward, and there was no lack of them, in spite of the severity of the selection.

footing, about 23,000 horses were required in the Amur Military District, and 1,000 in Kwantun. With the new formations the necessities amounted, for the troops of the Imperial Lieutenancy, to 35,000 horses. To make good the losses of the campaign, remount sections were established in the Imperial Lieutenancy, in Siberia, and in Europe. In the Amur District, five remount sections were formed, and in the zone of operations others were organised at certain points, especially at Kharbin. In other respects, it was by means of purchases on the spot that the Army directly made good its losses in horses, for the greater part of the time.

In Siberia two remount sections of 400 horses each, were established from the commencement; this number, which had been calculated for the Siberian troops alone, was found to be insufficient, and was increased to 10, 6 of which were for the Cossack troops. The object of these sections was to make good the losses of the Army; they also collected the horses left behind by units, and gave others in exchange. It was at first intended to have 23,000 horses in these sections in Siberia (one-tenth of the total effective), but the congestion of the railway only permitted the despatch of 8,178 horses to these remount sections, of which number only 5,867 were despatched to the Army before the conclusion of the war.

As the requisitions made in Europe did not always meet the needs of the Corps, on the 7th mobilisation, three remount sections (in all, 1,200 horses), were established in the Kazan District, which were intended to assist the Siberian sections to complete the units going out; these sections, however, were not required to act, the subsequent requisitions having given good results.

Turning now to demobilisation, it will be found that in Russia in Europe there were a larger number of horses in excess on the conclusion of peace (those, for instance, of the XXIst Army Corps, numbering 9,000, which were not despatched). In addition to the excess horses remaining with the various troops, which were formed on the last mobilisations, there were the horses of the three sections in the Kazan District, mentioned above, and three dépôt squadrons of the 5th Cavalry Regiment.

An Imperial Order of the 8th October, 1905, and thus, prior to the ratification of the treaty of peace, directed the utilisation of the best requisitioned horses in the demobilised Corps, by allowing them the option of purchasing them as their remount contingent, at a price less than 10 per cent. of the purchase price; the others to be sold by auction. The sale price, however, of these latter being considerably less than the purchase price, it was the average sale price and not the first purchase price diminished by 10 per cent., which formed the basis of the concession made to Corps and officers in some districts.

In short, the following were the methods pursued to liquidate the excess in horses:—

Special boards were formed, who immediately sold by auction all horses unfit for service; the remainder were used:

1. To complete the batteries lacking them.
2. To replace the horses unfit for service in the batteries.
3. As remount contingent for 1906 (7 years old at least), with a deduction of 10 per cent. in view of losses.

In addition, horses for the other artillery units in Europe, parks, dépôts, etc., were renewed, and the horses necessary for the machine gun companies formed in Europe¹ (about 1,500) were deducted.

¹ As a rule one per infantry division.

As regard the cavalry, the purchase of remounts for 1906 being already completed, the conditions above-mentioned could only be applied under more restricted conditions; the horses of the cavalry dépôt regiments were renewed, and 95 horses were given to the infantry for mounted orderly duties.

Precise information is lacking about the demobilisation of the horses of the Manchurian troops, which was left to the Commander-in-Chief. The following, however, are the *desiderata* expressed with regard to this subject :—

1. Send blood-horses (mares and stallions) to the Maritime Province and the Transbaikal, to develop the breeding.
2. Hasten the evacuation of the troops by repatriating them at the peace effective, only as regard the horses; thus, for an infantry regiment, 25 transport horses (instead of 304 on a war footing).
3. Employ the remaining horses to improve, as in Europe, the quality of the animals for the troops remaining in the Far East.
4. Sell the rest by auction.

At the same time, an order, issued on the 16th October, 1905, at the instigation of General Linievitch, authorised the gratuitous surrender of 22,500 horses to the population of the Amur District in recognition of good and loyal services rendered (Transbaikal 10,000; Maritime Province 8,000; Amur 3,000; Sakhatin 1,500 horses).

In addition, 500 horses were given to men who were discharged from the service, who remained in the Far East as colonists.—*Revue Militaire des Armées Etrangères*.

The Lessons of the Russo-Japanese War.—Under this title the *Revue d'Artillerie* has been publishing a series of articles translated from the Russian, which conclude as follows :—

“In concluding our observations on the lessons of the Russo-Japanese War, we consider we should lay stress on the following principal conclusions arising from them :—

“1. The Russo-Japanese War has clearly shown the superiority of the offensive over the defensive, from a strategic as well as from a tactical point of view. The perfection of the modern gun, whilst greatly adding to the radius of action of troops, has still further increased the advantage derived from taking the initiative in operations;

“2. The direction of the battle has become more complicated; initiative has become more necessary than ever to commanders of units. The Commander-in-Chief being only able to judge of the situation of an action from reports sent to him, commanders of all ranks should be carefully instructed in taking note of the various phases of an action so as to be able to render clear reports, to judge soundly, and to make appropriate decisions. They must also be impressed with the importance of furnishing accurate reports.

“3. It is necessary to prepare the soldier more carefully in taking intelligent interest in his firing, and to act on his own initiative;

“4. The fate of an action is decided, as formerly, by a success on a more or less important point, in concentrating in that direction superior forces for the attack. As formerly, the reserve and the bayonet attack are employed with that object.

"5. The fire still remains as a preparatory method;

"6. With the artillery, the most complete success results, as formerly, from the concentration of fire. The technique of the arm has merely changed the process employed to arrive at it; therefore, the *massing of batteries should be abandoned*;

"7. The intricacy of the preparations for battle demands that great importance should be attached to reconnaissance and observation;

"8. Both the Russian soldier and *matériel* were splendid;

"9. All the principles of military art were confirmed anew. All breaches of these principles, all improvisations were punished;

"10. From this it results that the war has shown the necessity for giving preparatory instruction to officers of all ranks.

"Victory is the result of the skilful execution of a well-conceived plan. The co-ordination of an operation of war is only possible when all the troops taking part in it combine their efforts towards a sole object clearly defined by the Commander-in-Chief. For that purpose all should equally understand and appreciate both the situation and the object of the operation indicated by the plan of action. The unity of appreciation can only be obtained by preparatory instruction carefully and regularly given."

Russian Army Medical Service. — "A Report on the Russian Medical and Sanitary Features of the Russo-Japanese War," by Surgeon Raymond Spear, U.S.N., has just been issued. In this work Surgeon Spear explains the organisation, scope, method and equipment of the Russian Medical Service, and gives a highly instructive account of its operations in the late war.

To understand the magnitude of the task which confronted the Russian medical service, it must be kept in mind that when war began on 8th February, 1903, Russia was wholly unprepared for a campaign in the Far East. In all of Manchuria and in the territory around Vladivostok there were, exclusive of the garrison at Port Arthur, only 60,000 Russian troops—such, at least, is the statement of the Russian statistical officer at Harbin. When peace was restored there were east of Lake Baikal 1,132,700 Russian soldiers, of whom 729,000 were strongly intrenched in front of the Japanese lines. To care for the health of this vast army, to enforce needful sanitary regulations, provide transportation for the sick and wounded, and give each case its proper treatment—such, briefly stated, was the work assigned to the medical service. That work, it may be said at once, was performed wonderfully well, making due allowance for the manifold disadvantages which attended it. The medical department of the Russian Army is patterned after that of the German Army, differing from the latter, however, in that it takes in many line officers, the head of the sanitary department during the late war having been a cavalry officer from General Linevitch's staff. The sanitary department of the army in the field consists of six divisions as follows:—(1) Medical department. (The medical inspector is the immediate chief, and has to do with the medical officers, medical supplies, and sanitation.) (2) The hospital department. (Usually a colonel of the line is the immediate chief.) Locating, constructing, and repairing of hospital department. (A line officer, usually a colonel, is at the head.) (4) Evacuation department. (A line officer, a colonel of the general staff, is at the head.) (5) Statistical office. (Chief medical statistical officer, usually a colonel, at the head.) (6) Veterinary department. (A veterinary inspector in charge.) The medical *personnel* of the Russian army east of Lake Baikal on 2nd

September, 1905, consisted of 2,360 doctors and 201 apothecaries. In the same territory there were under the Red Cross eighty-five permanent hospitals (permanent), total capacity, 22,000 beds; forty field hospitals, with necessary outfits for transportation, lazarettes, temporary stretchers, 25,000 beds; twenty-three sanitary trains, 12,000 beds. With these hospitals there were about 500 doctors, 1,500 "sisters" (as women nurses are called by the Russians), thirty pharmacists, eighty medical students, and 2,000 male attendants. From the outbreak of the war up to 14th May, 1905, the days in hospital by sick and wounded numbered more than 3,000,000; the sanitary trains carried 242 officers and 41,360 soldiers, who spent 314,734 days in transportation.

Doctor Spear declares that the magnitude of the preparations the Russians made for the treatment of the sick and wounded was the most striking feature of the medical aspect of the war. With the army there were in all nearly 3,000 doctors—one doctor to about 380 men. In Irkutsk there were hospital accommodations for 40,000 patients, in Udinsk for 10,000, in Harbin for 20,000, while at Tchita there were 160 buildings for hospital purposes. After the battle of Mukden there were over 60,000 sick and wounded in Harbin at one time. Many slept on stretchers, but all were under shelter and were well cared for. For handling the sick and wounded from the firing line back to the base hospitals the Russians had a large number of "sanitats" with haversacks full of first-aid packets, stretchers, stretcher bearers, transports, field hospitals, all so situated that they passed the disabled soldiers constantly toward the small De Cauville field railroads and the railroad proper to be placed on the sanitary trains which went northward and westward to the base hospitals. This current of sick and wounded was constant and more or less regular, so that it was possible to run the hospital trains almost on a fixed schedule, except after a battle, when practically all the traffic of the railroad consisted of trains for the wounded.

To show the efficiency of the Russian medical service, Dr. Spear states that the Russians who were killed in action or died of wounds from the beginning of the war up to 14th September, 1905, numbered 52,623. The total number of deaths from disease for the same period of time was but 18,830, or, speaking roughly, one man died of disease to three that died of wounds. If all the missing were counted as dead, and if the number of remote deaths from wounds, including those that fell into the hands of the Japanese, were counted in the above list, the proportion of dead from disease to dead of wounds would be still less—a most excellent record, unexcelled in any war. Dr. Spear goes on to say—and his words should interest those enthusiasts who would have the world believe that the Japanese medical service is little short of perfection:—

"The Russians and the Japanese each had a formidable camp disease to contend with. The Russians brought typhoid fever to their camps, and although a number of cases developed, the whole army would have been prostrated and rendered useless by the disease if sanitary measures had not been taken to check the disease and prevent its spread. On the other hand, the Japanese brought with them beri-beri, a disease with about the same death rate as typhoid fever, and a disease which incapacitates its victims absolutely for the performance of any military duties for months. We know more about the cause of typhoid fever and the modes in which the disease is disseminated than we do of beri-beri; but we also know that of the two diseases, beri-beri is the easier to combat and eradicate by means of diet and proper sanitary measures. So the large number of cases of beri-beri that developed in the Japanese army

rather points to the fact that as hygienists the Japanese were not superior to the Russians. Dr. Herzog, of the Bureau of Government Laboratories, of Manila, P.I., who was detailed to study beri-beri in the Japanese army, states in his report that between 75,000 and 80,000 cases of this disease were sent back to Japan from Manchuria during the last year of the war. There were in addition to these cases a number of severe ones that died in Manchuria. In other words, many thousand cases of a preventable disease developed in an army supplied with medical men that are considered good hygienists. These cases developed in the same territory that had been occupied by the Russian forces. The Japanese, either on account of a natural immunity, diet, or because many of them had already had this disease when young, exclusive of sanitary measures, did not suffer to the extent their opponents did from typhoid fever; but nevertheless a number of cases of this disease did develop among their army. In the Russian army no cases of beri-beri developed, but 17,033 cases of typhoid fever—a preventable disease—did occur; but this total number of typhoid cases during the whole war is but one-fifth of the total number of cases of the principal preventable disease of the Japanese camps (beri-beri) that occurred during the last year of the war. The total number of cases of beri-beri that occurred in the Japanese army during the whole war will probably never be known by the public. So it is safe to conclude that the Japanese forces lost the services of many more men through preventable camp diseases than did the Russians."

A careful study of Dr. Spear's valuable report will convince the unprejudiced reader that, so far as the medical service of her Army is concerned, Russia suffers nothing in comparison with that of her rival in the late war. "For safeguarding the health of the largest army ever gathered together in the world's history, through sanitary and military hygienic measures," says the author, "and for keeping it comparatively free from the many diseases that always threaten large assembled bodies of men, Russia must thank her medical men, for, though they were often hampered by the lack of authority, they showed that they were equal to the medical problems that constantly presented themselves, and were practical to a degree in the performance of their duties."—*Revue Militaire des Armées Etrangères* and *U.S. Army and Navy Journal*.

UNITED STATES.—*Garrison and Field Training*.—On this subject the following G.O. was issued on the 1st March, 1906, by War Department at Washington :—

1. Hereafter the practical training of the Cavalry, Infantry and Field Artillery of the Regular Army, will be divided into two distinct phases, namely, garrison training and field training.

2. Garrison training will include gymnastics and outdoor athletics, bayonet and kindred exercises, the details of tent pitching and striking, close order drills, ceremonies, guard duty, riding, horse exercise, the preliminary training for range firing, the mechanism of extended order drills, the hygienic care of the person, of buildings and of grounds, swimming, and generally all such needful instruction heretofore prescribed as can profitably be imparted on limited ground and under the conditions imposed by garrison life.

3. Field training will include range firing, practice marches, camping, and in connection therewith exercises of every kind calculated to instruct and prepare the soldier in peace for his actual duties in war. These will embrace advance and rear guard formations, attack and defence of convoys and of selected positions, outpost duty, reconnaissance

and patrolling by day and night, night marches, road sketching, the making of reports, the use of the intrenching tools, individual field cooking, etc. In this training the regulation field kit for each arm will invariably accompany the command, and on all marches, manœuvres, drills, and exercises, and in that part of the target course where prescribed the kit will be habitually carried in the authorised way, *i.e.*, by Infantry on the person, by Cavalry on the person and horse, and by Field Artillery on the person, horses, and carriages.

4. Throughout the year all companies, troops, and batteries will make at least one practice march each week, which for the Infantry shall not be less than twelve miles, and for the Cavalry and Field Artillery not less than eighteen miles. During that part of the year assigned especially to practical instruction one march in each month of three consecutive days, requiring two camps, shall be made. During this part of the year all organisations shall take the field for a period of not less than twenty-one consecutive days. On all marches involving an absence from the garrison overnight the command will march with the transportation, tentage, and baggage authorised in Par. 2, G.O., No. 201, W.D., Dec. 2, 1905. Should exceptional weather conditions forbid the practice march in any week it will be had as an additional march on the earliest practicable day following. A similar rule will govern respecting the three-day marches prescribed for each month of the period of practical instruction. While actually engaged in the prescribed range practice, organisations will habitually make the one day's practice march per week, but it may be omitted in the discretion of the department commander, if conditions are such as to make it impracticable. All practice marches will be made with full strength, commissioned and enlisted, with only such exceptions as the department commanders shall have approved.

5. Department commanders, under the supervision of division commanders, are charged with the rigorous execution of this order. They will, immediately on receipt hereof, and having due regard for the other demands of the service, so divide the time devoted to training between the garrison and the field as to fulfil the requirements of this order while making the two kinds mutually helpful. Practice marches and camps are to be utilised to the full for all kinds of field training, as indicated in Par. 4 of this order, and a progressive scheme for each post will be adopted in advance and adhered to throughout the year. In their annual inspections particular attention will be paid by department commanders to the working of this system and the results will be given, with suitable recommendations, in their annual reports.

6. Hereafter, skirmish fire, both instruction and record practice, will be conducted in marching order as prescribed below. *a.* In the Infantry the field kit, as prescribed in G.O., No. 23, W.D., Feb. 2, 1906, will be carried, exclusive of rations and rifle ammunition in excess of twenty rounds per man. The canteen will be filled. The following articles of the field kit will be carried in the blanket roll made up as prescribed in Par. 486, Infantry Drill Regulations, *viz.* :—

One half-shelter tent, five shelter-tent pins, one shelter-tent pole, one blanket, one comb, one housewife, one rubber poncho, one cake of soap, one pair of stockings, one toothbrush, and one towel.

b. In the Cavalry the following articles of the field kit will be carried, *viz.* :—

One U.S. magazine rifle (calibre .30), one revolver, one gun sling, one rifle cartridge belt and fastener and loop for sabre attachment, one pair of rifle cartridge-belt suspenders, one first-aid packet (Medical Depart-

ment), one pouch for first-aid packet, one revolver holster, one revolver lanyard, one canteen, filled; one canteen strap, two spurs, two spur straps, twenty rounds of ball cartridges (calibre .30), and twenty-four rounds of revolver ball cartridges.

c. Officers and enlisted men permitted but not required to fire will be equipped as in their arm of service.

d. Pistol practice, mounted course, will be conducted in the field kit for Cavalry, as prescribed in G.O. No. 23, W.D., 1906, with saddles packed as per Par. 289, Cav. D.R.

e. Instruction practice, slow and rapid fire, may be conducted, or partly conducted, in the kit prescribed above, or any part of it, in the discretion of the company or troop commander.

f. In order that men may receive a certain amount of instruction under winter conditions, an additional allowance of ammunition of twenty rounds per man is authorised, to be expended under the direction of the post commander. This firing will be additional practice and will be held, where practicable during the winter, at such times and will include such classes of fire as division commanders may direct. Overcoats and field kits as prescribed above will be worn in this class of instruction.

Division commanders will make full report and recommendation on small arms firing with the field kit as soon as practicable after the close of this year's regular practice season.

CORRESPONDENCE.

THE CARE OF THE SOLDIER'S FEET.

To the Editor of the JOURNAL OF THE ROYAL UNITED SERVICE INSTITUTION.

SIR,—A famous general is reported to have said that most battles are won on the soldier's stomach; but it would have been equally true if he had said that many battles are won or lost on the soldier's feet.

A soldier is quite unable to make a sudden and rigorous attack after a long forced march if his feet are tired and sore, while statistics of manœuvres, both at home and abroad, show that a very large percentage of men report sick with sore feet after every march of from fifteen to twenty miles' distance, and a still larger proportion of men suffer with sore feet and do not report sick. This large percentage of "ineffectives" must considerably minimise the efficiency of the Army in war time, when the result of a battle often turns on the ability of one side to reach a point of vantage before the other, and it stands to reason that, other things being equal, the side with the best conditioned feet will get there first.

The cause of this inefficiency, which I am convinced is greater in our Army than in other large European Armies, is not very hard to find, and is one that if proper measures were taken for the care and preservation of the soldier's feet in peace time would considerably increase the efficiency of our troops in an age when efficiency in every little detail is absolutely essential in order to command success. A recruit on enlistment has, or rather should have, a foot free from deformity or defect, and it is hard to see why his feet should not improve rather than get worse during his period of service. Yet if the feet of any infantry battalion be examined, it is quite unusual to find any man without some slight deformity.

A very obvious cause of "foot trouble" is the system, or rather want of system, of properly fitting the recruit with boots and socks on enlistment. A recruit on joining a regimental dépôt is, according to regulation, supplied with two pairs of boots, which are theoretically examined as to fitness by his company officer. These two pairs of boots are to last the recruit for the ensuing year, and taking for granted that the "fitting" of the boots has been conscientiously carried out, it must be remembered that the recruit as a rule is still a boy, and that during the year following his enlistment his foot is liable to increase in size, and as a result of this his second pair of boots may be considerably too small for him. To combat this difficulty it is the custom in some dépôts to supply the recruit with two sizes in boots, his second pair being a larger size than those in use, and although this may to a certain extent overcome the difficulty, it is unfortunate for the boy whose foot doesn't happen to grow to the size of his second pair of boots.

The present "regulation boot" is supplied in 9 sizes and 4 magnitudes, quite sufficient for the fitting of a normal foot, but no proper allowance is made for a soldier having some little individual peculiarity, such as an unusually high instep, very small ankle, etc., etc., which will render his marching in an unaltered "regulation boot" extremely uncomfortable, but could easily be remedied by a skilled bootmaker.

The system of "special measurements" which is allowed by regulation is unsatisfactory and often useless.

This brings up the question of why it should be more necessary to have a "master tailor" to see to the correct fitting of a recruit's uniform (which any intelligent officer or non-commissioned officer is certainly qualified to do) than to have a "master bootmaker" to properly fit a recruit with boots, and to make any alterations from the "regulation pattern" to suit individual peculiarity.

The correct fitting of boots requires skill, and skilled labour should be employed for this purpose. Civilian bootmakers might be enlisted as "master bootmakers" under same conditions as "master cooks" and armourer sergeants are now enlisted; they should not be young boys, but should be accepted up to the age of 26 or 28 years, and really good qualified men, even if married, should be accepted. This would admit of men of skill and experience being recruited from the largest and best boot firms. They could be made responsible for the correct fitting of the soldier's boot all through his service, and the deformities which one so usually meet in the soldier's foot, as "ingrowing toe nail," hammer toe," "splay foot," "flat foot," "bunions," etc., etc., would practically disappear.

Having legislated for the care and supply of properly fitting boots and socks--I add socks, as they require quite as much attention as the soldier's boots--the next point to consider is the prevention of those common ailments to which the soldier's foot is so liable if not looked after, and also to prepare his feet for the strain of long marches, both on manoeuvres and in war time. In order to successfully carry this out, a more thorough system of regimental chiropodists is necessary; and by "chiropodist" I do not merely mean a man who has been instructed how to cut corns and to trim "toe nails," but a man thoroughly acquainted with all the minor ailments to which the soldier's foot is subject, and fully qualified to treat and prevent these ailments. He must be a man able to command authority, and must be "well up in" and take an interest in his job.

Under the present Army Regulation for Chiropodists, one man per infantry battalion or dépôt, after having obtained a certificate of proficiency in chiropody, may be appointed as battalion chiropodist, with 4d. a day

extra duty pay, but he will not be struck off any duties. This man is presented with a beautiful case of many unnecessary instruments, and is then often left solely to his own devices to do just as much or little work as he likes, which in many cases amounts to absolutely nil. In one infantry battalion I found the chiropodist was doing the duty of "sick orderly," and had been doing so for some years. After enquiring why the chiropodist should do this duty, which kept him all day at the hospital, I was told he was a very old soldier, and that they had made him chiropodist in order to give him the extra pay, but that he never did any chiropody!

To obtain any benefit from chiropodists, one chiropodist per company is necessary. This man should be a lance-corporal or corporal, intelligent, carefully trained, and a man who takes an interest in his work. His duties should be clearly laid down and explained to him, and every week, under the supervision of the company officer, the men should be paraded with bare feet, and he should inspect them as to cleanliness and any tendency to corns, blisters, etc. Any men who are subject to "scalded," "blistered," or "fired feet" should be told to "fall out," and afterwards be instructed in the method of preventing their own particular ailment.

Before manœuvres or active service the chiropodist would issue to all men one of the numerous preparations for hardening the men's feet, and those men who are known by the chiropodist to be subject to any particular kind of "foot trouble" would apply to him daily on the "line of march" for advice and preventative treatment.

A man who under these conditions "reports sick" or "falls out" on the lines of march with sore feet, and who hasn't previously reported sick to the chiropodist, should be punished, as is the case in the German Army. The great mistake that most people make is to look upon the chiropodist simply as a "cutter of corns" and "trimmer of toe-nails," whilst on the contrary, only on very rare occasions should he perform these duties, but instruct the men how to do it themselves, his great use being to instruct the men how to guard against and prevent every kind of "foot trouble," and to advise and treat any cases of "sore feet" that occur.

Unofficially, and thanks to the aid of a far-seeing adjutant, I was enabled to carry this system of "company chiropodists" into practice during the Salisbury Plain manœuvres of 1904, and to contrast the result with a regiment in which no trouble was taken to look after the soldiers' feet, and in which there was no chiropodist at all.

One instance is absolutely conclusive of the superiority in marching of the battalion with the company chiropodists. A march of about thirty miles was made over bad country, with a bivouac in the middle. Both regiments performed practically the same duties, marched exactly the same distance, and had had the same previous training. The morning following the return to camp, the battalion I had trained in chiropody, and in which the chiropodists had been supplied with powders, ointments, etc., to carry on the march, had 2.5 per cent. per company sick with sore feet, whilst the other battalion had over 25 per cent. per company. These figures are very high, but the men who reported sick were mostly newly-joined recruits and unaccustomed to marching; also it practically represented the sick of two days; but in whatever way it is looked at, it shows that much can be done to improve the efficiency of the soldier if proper attention be paid to the care of his feet.

C. R. BRADLEY, Lieut. R.A.M.C.

NAVAL AND MILITARY CALENDAR.

OCTOBER, 1906.

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- 1st (M.) H.M.S. "Pyramus" recommissioned at Sydney.
 " " H.M.S. "Formidable" and "Majestic" paid off at Portsmouth.
 " " H.M.S. "Britannia" commissioned for Atlantic Fleet.
 2nd (T.) H.M.S. "Formidable" recommissioned for Mediterranean.
 3rd (W.) 2nd Bn. Dorsetshire Regiment left England for India in the "Plassy."
 4th (Th.) 3rd Bn. Middlesex Regiment left South Africa for Hong Kong in the "Soudan."
 6th (Sat.) 9th Lancers } left India for South Africa in the
 " " 2nd Bn. Welsh Regiment } "Dufferin."
 8th (M.) 3rd Bn. Lancashire Fusiliers left South Africa for Ireland in the "Avondale Castle."
 11th (Th.) 3rd Bn. Coldstream Guards arrived in Egypt from England in the "Sicilia."
 " " 2nd Bn. Leicestershire Regiment arrived in India from England in the "Dongola."
 15th (M.) 1st Bn. Rifle Brigade left Malta for England in the "Sicilia."
 16th (T.) French Submarine "Lutin" foundered off Biserta, with the loss of 14 officers and men.
 19th (F.) 1st Bn. Leicestershire Regiment left India for England in the "Dongola."
 20th (Sat.) 9th Lancers } arrived in South Africa from India in
 " " 2nd Bn. Welsh Regiment } the "Dufferin."
 24th (W.) 1st Bn. Rifle Brigade arrived in England from Malta in the "Sicilia."
 25th (Th.) 2nd Bn. Dorsetshire Regiment arrived in India from England in the "Plassy."
 26th (F.) French Submarine "Lutin" raised and placed in dock.
 27th (Sat.) 46th Co. R.E. } left South Africa for England in the
 " " 3rd Bn. Manchester Regt. } "Braemar Castle."
 28th (S.) XIth and XIIIth Brigades R.F.A. left South Africa for India in the "Dufferin."
 29th (M.) H.M. The King of Spain witnessed Army Manœuvres in the province of Toledo.
 30th (T.) 3rd Bn. Middlesex Regiment arrived in Hong Kong from South Africa in the "Soudan."
 " " 53rd Co. R.G.A. left St. Helena for England in the "Cluny Castle."
 31st (W.) H.M. The King accepted the custody of the Colours of the 3rd Bn. Scots Guards, on disbandment, at Buckingham Palace.
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FOREIGN PERIODICALS.

NAVAL.

ARGENTINE REPUBLIC.—*Boletín del Centro Naval*. Buenos Aires : September, 1906.—Has not been received.

AUSTRIA-HUNGARY.—*Mittheilungen aus dem Gebiete des Seewesens*. No. 11. Pola: November, 1906.—"The New Education System for

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the Beauce." "Incidents of Neutrality in the Russo-Japanese War" (continued).

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Rivista Militare Italiana. Rome: September, 1906. — "To our Readers." "Our Fortress Artillery" (*continued*). "The Insurance Society for Officers of the Army and Navy of the Italian Kingdom" (*con-*

tinued). "Present-Day Criticisms on Modern Italy" (*continued*). "A Plea for New Musketry Regulations." "The Country of the Cunama" (*continued*). "Defensive Tactics on the Alps" (*continued*). "Statistical Notes."

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Revista Científico-Militar y Biblioteca Militar. Barcelona: October, 1906.—"Regimental Libraries." "A Strategical Psychological Study of the First Period of the Russo-Japanese War" (*concluded*). "The Utility of Shields in Field Artillery." "Signallers in the German Army." "Connection between the Different Units in the Battle-field."

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Army and Navy Life. New York: October, 1906.—"Field Instruction and Manœuvres." "New Military Features at Mt. Gretna." "The Review of the Atlantic Fleet." "The Unveiling of the Peace Tablet at Portsmouth." "The German Navy." "The Chickamanga Manœuvres." "Old Time Naval Blunders." "How Russia Crushed Alexander I. of Bulgaria." "Old Landmarks at the Charlestown Navy Yards." "A Commander of the Constitution." "Power Doors for Ships' Bulkheads." "The Battle of Tsushima." "The German Military Academy."

Journal of the U.S. Cavalry Association. Fort Leavenworth, Kansas: October, 1906.—"The Federal Cavalry with the Armies of the West, 1861-65" (*Prize Essay*). "The Avenger of Blood." "Odds and Ends of Improvement." "An Interesting Case to Horsemen." "The Mindanao Moro." "The Diamond Hitch." "Moot Courts." "Problems." "Pistols v. Sabre." "Reprints and Translations." "Military Notes."

NOTICES OF BOOKS.

The Naval Annual, 1906. Edited by JOHN LEYLAND and T. A. BRASSEY, A.I.N.A. Portsmouth: Griffin & Co. 15s.

This year's Naval Annual is more than usually interesting, and the high standard of excellence for which we look in this useful work of reference is fully maintained. Probably the papers of most interest to naval readers are those on "The Attack and Defence of Commerce," by Mr. J. Thursfield; "The Russo-Japanese Naval Campaign," by Mr. J. Leyland; and "The Trafalgar Centenary and its Literature," by the same well-known writer; the two chapters on "The Engineering Question," which is treated from two opposing points of view by Lieutenant Carlyon Bellairs and an anonymous writer under the pseudonym of "Archimedes"; and, lastly, the chapter devoted to "The Problem of Speed—Both Sides of the Question."

What may be called the permanent features of the volume do not call for much comment, consisting as they do of the usual summary of the progress of our own and foreign Navies, and a chapter on "Comparative Strength," which is contributed as usual by Mr. T. A. Brassey. Mr. Thursfield's interesting paper on "The Attack and Defence of Commerce" comes next. He is an optimist, and holds that "so long as this country retains an effective command of the sea, the maritime commerce of the whole Empire, though not entirely immune to injury and loss, will, on the whole, be exposed to far less risk than British maritime commerce had to incur in the war of the French Revolution and Empire. This risk has been estimated at not more than $2\frac{1}{2}$ per cent. per annum on the total value of the commerce involved." Other authorities, however, place the loss as having been nearly 4 per cent. We quite agree with Mr. Thursfield,

that the performances of the "Alabama" are not likely to be repeated against our trade, provided that our fleet is maintained at a proper strength; but we hold, nevertheless, that he is inclined to underrate the difficulties of effectively protecting our sea-borne trade, particularly in the early weeks, or even months, perhaps, of a great war, until we have obtained that command of the sea, which is of paramount necessity for us. If maritime commerce is, as Mr. Thursfield asserts, far less assailable than in former times, it must be also remembered that in those former times this country was practically self-supporting, while in the present day we are dependent on our merchant fleet, not only for our prosperity, but for our very existence, so that the cessation for a few weeks or months of our food supplies and the raw materials, on which so many of our manufactures depend, might well bring the bulk of our population to the point of starvation and compel us to make an ignominious peace. And it is in the damage to our trade during the early stages of a war, say with Germany, that our chief danger lies, especially as in the present distribution of our fleet our sea-borne trade in the Pacific and South Atlantic is absolutely unprotected, every cruiser in those waters having been withdrawn.

In his chapter devoted to "The Russo-Japanese Naval Campaign," Mr. Leyland continues the account of the operations which was contributed by Admiral Sir C. Bridge in last year's Annual. The long voyage of the Baltic Fleets and their destruction at the battle of Tsushima are fully described, the author having evidently been at great pains to collate and compare details drawn from all available sources. He does not, however, himself attempt to enforce any lessons from the great battle, although he says: "Many lessons may doubtless be drawn from the events of the battle—lessons of the importance of efficient gunnery, of the relative value of speed, of the right character and distribution of armour and armaments, and of other matters. The object of the writer has been to enable naval officers to discover the lessons of Tsushima for themselves." Mr. Leyland's account is certainly a most valuable sequent narrative of the operations.

The space at our disposal will not let us do more than recommend both the chapters on the "New Scheme of Naval Training" for reading. With many of the arguments advanced by Lieutenant Bellairs against the new system most naval officers will probably be in full agreement. The chapter on the "Problem of Speed" is one also which will interest those who have not had opportunities of making themselves acquainted with the views of foreign writers on this question. The writer (who is anonymous, but well-informed) has collected the opinions of various authorities, but he contents himself with stating both sides of the question without attempting a definite solution.

Other papers deal with "Steam Engineering," contributed, as usual, by Mr. Dunell, a well-known authority; "Naval Reserves and Sea Training," by Lord Brassey, who also contributes another short paper on "Admiralty Policy before Parliament," as embodied in the Cawdor Memorandum; the "Italian Navy," by Commander Poladini; and "The Gunnery Practice of the Fleet," by Commander C. N. Robinson, who also, with Mr. Leyland, contributes the tables of "British and Foreign Ships," the plans for which have been prepared, as usual, by Mr. S. W. Barnaby. Part III., is, as usual, devoted to "Armour and Ordnance," which is shorter than usual, the author giving as a reason that "there is practically no very notable development to record. And in regard to trials, both at home and abroad, there is a great tendency to conceal the actual results

attained." Part IV. concludes the volume with the usual Statistics, Official Statements, and Papers.

Mr. Leyland and Mr. Brassey may be heartily congratulated on the excellent edition of the Annual they have this year produced.

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A Manual of the Laws and Usages of War on Land. By A. G. LEECH. Demy 12mo. (Presented.) (E. Ponsonby.) Dublin, 1906.

The Russo-Japanese War on Land. By Captain F. R. SEDGWICK. 8vo. 3s. 6d. (Presented.) (Forster, Groom & Co., Ltd.) London, 1906

The Great Plateau. By Captain C. G. RAWLING. 8vo. 15s. (Edward Arnold.) London, 1905.

Annals of the Peninsular Campaigns from MDCCCVIII. to MDCCCXIV. By the Author of *Cyril Thornton*. 3 vols. Crown 8vo. (Presented.) (William Blackwood.) Edinburgh, 1829.

Lessons of the Russo-Japanese War. By General DE NEGRIER. Translated by Second Lieutenant E. L. SPIERS, 8th Hussars. 8vo. 3s. 6d. (Presented.) (Hugh Rees, Ltd.) London, 1906.

From Midshipman to Field Marshal. By F.M. Sir EVELYN WOOD, V.C. 2 vols. 8vo. 25s. (Methuen & Co.) London, 1906.

Regimental Standing Orders of the Army Service Corps, 1906. Official. Crown 8vo. 6d. (Presented.) (Harrison & Sons.) London, 1906.

Army Sketching and Map Reading for Non-Coms. and Men. By Captain R. F. LEGGE. Crown 8vo. 1s. 6d. (Presented.) (Gale & Polden.) Aldershot, 1906.

Dr. Bourges à Villersexel (20 Décembre, 1870—10 Janvier, 1871). By G. GUIONIE. 8vo. 3s. 2d. (Henri Charles Lavauzelle.) Paris, 1906.

The Russo-Japanese War, Fully Illustrated. 3 vols. 40s. (The Kinkodo Publishing Co.) Tokyo, 1904-05.

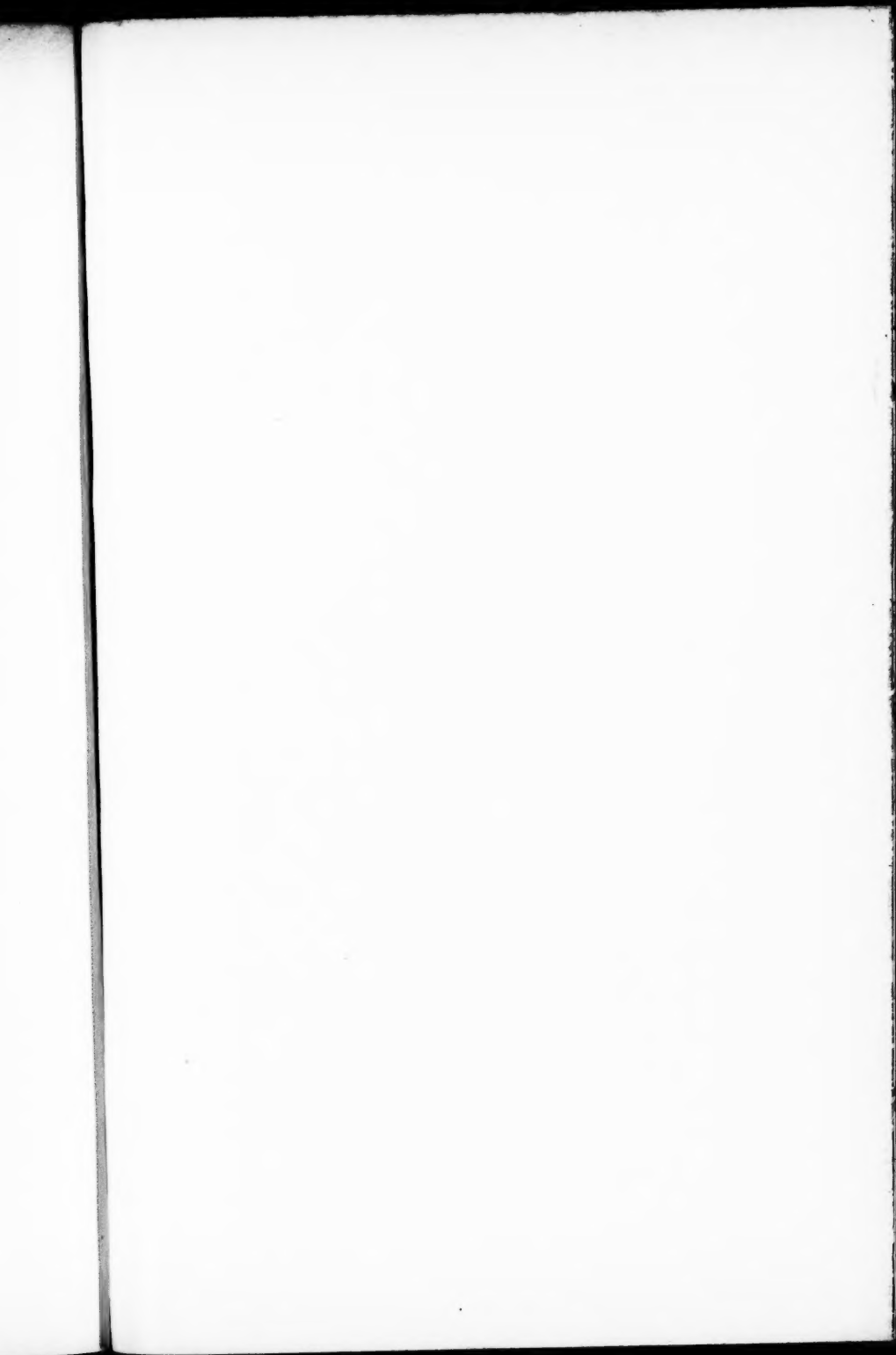
Admiral Togo. By ARTHUR LLOYD. Crown 8vo. 2s. (The Kinkodo Publishing Co.) Tokyo, 1905.

The International Position of Japan as a Great Power. By SEIJI. G. KISHIDA. 8vo. 10s. (Columbia University Press.) New York, 1905.

Western Tibet and the British Borderland. By C. A. SHERRING. 8vo. 21s. (Edward Arnold.) London, 1906.

Histoire Militaire du Congo. By A. LEJEUNE-CHOQUET. 8vo. 4s. 6d. (Berger-Levrault et Cie.) Paris, 1906.

- Lithgow's Rare Adventures.* By WILLIAM LITHGOW. 8vo. 12s. 6d.
(James MacLehore & Sons.) Glasgow, 1906.
- Arctic Exploration.* By J. DOUGLAS HOARE. 8vo. 7s. 6d. (Methuen & Co.) London, 1906.
- Portuguese East Africa.* By R. C. F. MAUGHAM. 8vo. 15s. (John Murray.) London, 1906.
- The Voyage of the "Scotia."* By Three of the Staff. 8vo. 21s.
(William Blackwood & Sons.) Edinburgh, 1906.
- The Native Problem in South Africa.* By ALEXANDER DAVIS. Crown
8vo. 6s. (Chapman & Hall, Ltd.) London, 1903.
- Regulations for the Army Medical Service, 1906.* Official. Crown 8vo.
6d. (Presented.) (Harrison & Sons.) London, 1906.
- Les Grands Cavaliers du Premier Empire.* By C. THOMAS. 2 vols.
8vo. 11s. 6d. (Berger-Levrault et Cie.) Paris, 1890.
- Campaigns against India from the West and through Afghanistan.* By
Major-General L. N. SOBOLEFF. Translated and condensed from the
Russian by Lieut.-Colonel W. E. GOWAN. 8vo. London, 1903.
- To India—Military, Statistical, and Strategical Sketch—Plan of Future
Campaign.* By B. T. LEBEDEV. Translated from the Russian by
Lieutenant H. C. HOLMAN, I.A. 8vo. London, 1901.
- Cavalry in Future Wars.* By General VON BERNHARDI. Translated by
C. S. GOLDMAN. 8vo. 10s. 6d. (John Murray.) London, 1906.
- Bengal in 1756-1757.* Edited by S. C. HILL. 3 vols. 8vo. 36s. (Pub-
lished for the Government of India.) (John Murray.) London, 1905.
- The English in the West Indies.* By J. A. FROUDE. New Edition. Crown
8vo. 2s. (Longmans, Green & Co.) London, 1888.
- L'Esprit de la Guerre Moderne—Sadoua.* By Général H. BONNAL. 8vo.
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THE BARR AND STROUD RANGEFINDER, FQ TYPE, 4 FT. 6 IN. BASE.

ON MOUNTING HM TYPE.

FOR USE WITH FIELD ARTILLERY.

(As supplied to the Japanese Army.)

The Rangefinder is mounted on Roller Bearings, and is readily controlled both in azimuth and in altitude, by the observer.

The Mounting is collapsible, and stows into a small space. It is held together by straps when stowed.

The Mounting is arranged so that it can be used by an observer either when kneeling or standing.

Approximate uncertainty of observation:—

2	yards at 1,000 yards.
8	" 2,000 "
30	" 4,000 "
100	" 7,000 "

BARR AND STROUD,
ANNIESLAND,
GLASGOW.



THE RAW MATERIAL.



THE FINISHED ARTICLE.

THE GURKHA SOLDIER.
See page 1504.

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